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ABSTRACT

This report analyzes the base salary trends of Minnesota's school teachers over the past two decades. At the statewide level, the report examines teacher salary trends both in nominal dollars and after statistically controlling for price inflation, increasing teacher training and experience, and increasing urbanization of the work force. Salary trends are also analyzed at the substate level, stratifying by geographic regions and by school district type. Minnesota teacher salary trends are then compared to those in surrounding states and the nation as a whole. Since 1982, when a budgetary crisis eliminated 4,000 to 5,000 teaching positions, both per pupil ratio and average teacher salary have sharply increased, since remaining personnel were more experienced and highly trained. When statistical controls are applied, the average state teacher salary is about 3 percent higher in 1988-89 than in 1974-75, but about 5 percent lower that its 1970-71 peak. Average teacher salaries differ considerably among different types of districts. In 1989-90, the average teacher salary in Minnesota stood at 103.5 percent of the national average and ranked 15th among the states. In constant dollar terms, the salaries of American teachers initially peaked in 1972, lost purchasing power the rest of the decade, and gradually returned to the 1972 peak during the 1980s. Appendices contain summary trend data, price inflation adjustment methodology, training and experience adjustment methodology, and urbanization adjustment methodology. (MLH/Author)

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Teacher Salary Trends In Minnesota: 1974-1988

A Research Report

January 1991

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Teacher Salary Trends In Minnesota: 1974-1988

A Research Report

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This study was designed and conducted by **Jim Cleary**, Senior Research Methodologist, in collaboration with **Tim Strom**, Legislative Analyst.

Jim Melcher provided extensive research assistance throughout, in addition to authoring Chapter 5.

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Executive Summary

This report analyzes the base-salary trends of Minnesota's public school teachers over the past two decades. At the statewide level, it examines teacher salary trends both in nominal dollars and after statistically controlling for: 1) price inflation, 2) increasing teacher training and experience and 3) increasing urbanization of the teacher workforce. Relevant school staffing changes are also noted. Salary trends are also analyzed at the substate level, stratifying by geographic regions, as well as by type of school district using school district clusters developed in an earlier phase of this research. Finally, Minnesota teacher salary trends are compared to those in surrounding states and the nation as a whole.

The Data Source and Definition of Teacher

The primary data source for this study is the Licensed School Personnel Records data base maintained by the Minnesota Department of Education. The unit of analysis is the individual teacher, not the district's salary schedule. The base-year data files date to the 1974-75 school year, **making 1974-75 to 1988-89 the time frame for this study.**

To ensure comparability across years of the study, **teachers are defined as including both full-time classroom teachers and other instructional support staff,** such as counselors and school psychologists, who are paid on the same step and lane (i.e., training and experience) basis. The analysis excludes those teachers and instructional support staff who are on leave or working in part-time, temporary or post-secondary positions, as well as all licensed personnel in administrative and supervisory positions. In 1988-89, for example, of the nearly 53,000 licensed school personnel in the state, 42,008 (79.4%) met these conditions for inclusion in the study, while 10,884 (20.6%) did not.

Relevant Teacher Staffing Trends

As a background for the salary trend analysis, we analyzed relevant school enrollment and staffing trends, as well. **Between 1974-75 and 1984-85, public school enrollments declined by over 21%,** or by nearly 89,000 elementary and secondary students, before reversing direction and increasing by nearly 4%. **During this time period, decreases in the number of teachers lagged behind enrollment declines, while staff increases preceded the recent enrollment increase, resulting in a fairly steady albeit small decline in the pupil/staff ratio.**

The notable exception to this pattern occurred during 1981 and 1982 when the seemingly intractable state budgetary crisis resulted in sharp cuts in state aids and the elimination of 4,000 to 5,000 teaching positions. This teacher cut is reflected in a relative surge in the corresponding pupil/staff ratio in the 1982-83 school year. It is also reflected in the average years of teaching experience for the teacher workforce, which has been steadily increasing both before and after the sudden jump due to the relative reduction in the number of newer teachers. **This, in turn, produced a relatively sharp increase that school year in the average salary of the teacher force, since the remaining personnel were generally more experienced and more highly trained.**

Statewide Teacher Salary Trends

Throughout the study period, teachers' salaries were trending upward at a notable pace, increasing from a statewide average of $12,214 in 1974-75 to $31,421 in 1988-89, for an overall increase of 157.3% for the 14-year period.

The major driving force behind this near tripling of salaries was general price inflation. In constant dollars, the average teacher salary increased by only 17.7% over this period.

Nearly all of this remaining increase in real salaries of teachers has been due to the increased training and experience of the teacher force.

When statistically controlling for the effects of both price inflation and increased levels of teacher training and experience, the average salary of Minnesota teachers is about 3.4% greater in 1988-89 than it was 14 years earlier.

A further statistical control for the effects of increasing urbanization in the state surprisingly showed virtually no impact to date of this factor on the statewide average teacher salary. Even though considerable urbanization has occurred during the time frame of this study, and even though teacher salaries are generally higher in urbanized areas, the effect of this factor has been negligible since the proportion of teachers working in urbanized districts has remained virtually constant throughout this period. That is, the spread of urban areas to encompass more districts and more teachers has been offset by a sharp decline in the enrollments, and hence number of teachers, in several large central-city and older suburban districts.

Using other published data, we found that **by the 1974-75 school year, the beginning year of this study, the purchasing power associated with Minnesota teachers' salaries had already eroded by 8.3% from its constant dollar peak, which occurred in 1970-71.**

In summary, when statistically controlling for the effects of price inflation, increased teacher training and experience, and increasing urbanization of the teacher workforce, the average salary of Minnesota teachers is about 3% higher in 1988-89 than in 1974-75, but about 5% less than its 1970-71 peak.

Substate Salary Trends

Substate analyses of teacher salary trends were conducted in two ways: 1) using school district clusters (i.e., groupings) which we had developed in an earlier phase of this research; and 2) using ECSU regions. This analysis produced the following findings.

Teacher Salary Trends By School District Clusters

Average teacher salaries differ considerably among the different types of districts. In general, the above-average salaries are found in two types of districts: 1) large metro districts with declining enrollments, and 2) in urban-nonmetro and suburban-

metro districts with high salary schedules. The lowest average salaries, on the other hand, are generally found among small, rural districts with declining enrollments.

There is considerable stability in the relative salary levels of the different types of districts from year to year.

More than half of the observed salary differences among the different types of districts is due to differences in teacher training and experience.

There is not a close relationship between the level of teacher pay in a district and the district's level of salary and benefit costs on a per pupil basis. For example, the group of districts with the highest average per-pupil salary and benefit costs have nearly the lowest average teacher salary figure. This cluster consists of 23 very small, rural districts with generally declining enrollments, a situation not conducive to efficiency.

There has been some movement toward convergence in the salary figures among the different types of districts. When expressed as a percentage of the statewide average teacher salary for a given year, the spread between the highest and lowest average salaried clusters of districts narrowed by about one-fourth (i.e., from 21.5 percentage points to 15.5) during the 14-year study period.

Teacher Salary Trends By Geographic Regions

When grouping school districts using the nine Education Cooperative Service Units (ECSU's), the following was found:

The unadjusted average salary figures vary considerably among the regions. In 1988-89 for example, the regional averages range from a low of $26,922 for region 6 (Southwestern Minnesota) to a high of $34,389 for region 11 (Twin Cities metro area). Region 3 (Northeastern Minnesota), with an average salary of $31,679 is the only other region with an above-average salary level. Of the remaining regions, region 10 (Southeastern), with an average salary level of $30,361, comes closest to the statewide average.

As with the cluster groupings, the lower-salaried districts tend to have lower levels of teacher training and experience. Hence, the regional salary differences are less pronounced (by about half) when statistically controlling for training and experience differences.

Again, there is considerable stability in the regional salary differences over the study period. Only relatively minor shifts have occurred, with region 3 (Northeastern) experiencing a slight moderating of its lead over the other nonmetro regions, and regions 1 (Northwestern) and 7 (Northern metro fringe) experiencing a slight increase in their average salary standings.

Minnesota Teacher Salaries Compared With Salaries In Other States

The National Education Association (NEA) and the American Federation of Teachers (AFT) annually publish state by state teacher salary figures for comparative purposes. These data reveal that **Minnesota's average teacher salary has consistently been at or somewhat above the national average for at least the past twenty years,** ranging from 99.4% of the national average in 1977-78 to 111% in 1983-84.

During this 20-year period, Minnesota's average teacher salary has ranked between 10th and 20th in every year except two: in 1979-80 it slipped to 21st, and in 1985-86 it rose to 7th rank.

In 1989-90, the average teacher salary in Minnesota stood at 103.5% of the national average, which ranked 15th among the states.

Comparing Minnesota to bordering states and other states belonging to the Big Ten Athletic Conference revealed the following:

Teacher salaries in both of the Dakotas have lagged far behind Minnesota throughout this period. For the past 5 years, South Dakotas average teacher salary has ranked last among the states, while North Dakota's recently slipped to 47th place.

Teacher salaries in Indiana, Iowa and Ohio, while higher than in the Dakota's, have also consistently lagged behind salaries in Minnesota. Iowa's ranking has been slipping throughout the 1980's and currently stands at 37th among the states, while Ohio's has crept up to 17th place.

Minnesota's average teacher salary has nearly always been higher than Wisconsin's during the past two decades, though the margin has usually been slight. Since 1988-89, Wisconsin has edged ahead of Minnesota into 14th place.

Throughout the 1970's, Minnesota's average teacher salary lagged behind that of Illinois, though the gap has been narrowing so that Minnesota's average salary actually rose above that of Illinois for a brief period in the mid-1980's before falling back again.

Michigan is the only one of these Midwestern states whose average teacher salary has consistently surpassed Minnesota's during the past two decades. During most of these years, Michigan ranked from 3rd to 6th among the states, though it recently slipped to 9th place. During 1989-90, Michigan teachers earned on average nearly $4,000 more than teachers in Minnesota.

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American Teacher Salaries Overall: 1970-1990

In constant dollar terms, the salaries of American teachers initially peaked in 1972. Then they lost purchasing power throughout the rest of the decade, which was marked by the OPEC-instigated energy crisis, the economic recession of 1974 and 1975 and the high price inflation continuing into the beginning of the 1980's. The decline in school enrollments, which began in 1971 and continued until quite recently, may have further contributed to the erosion of teacher salaries relative to inflation by ensuring a surplus of teachers in most geographic and substantive areas during this time period.

This trend experienced a dramatic turnaround in the 1980's, however. After bottoming out in real-dollar terms in 1981, real teacher salaries nationally have increased in every year to the present, thereby gradually returning to approximately their 1972 peak for purchasing power.

Relative to teacher salaries nationally, Minnesota's teachers' salaries in real-dollar terms peaked two years earlier (i.e., in 1970), declined somewhat more sharply, and recovered a bit more rapidly. Minnesota teacher salaries peaked relative to the nation in 1985, and they have been falling back in ranking since then, sliding from 7th to 15 place.

Policy Implications

Whether Minnesota's teacher salaries have fared well or poorly over the past two decades depends on which findings one wishes to emphasize.

> On one hand, the trend analysis shows that Minnesota teachers lost considerable purchasing power during the decade of the 1970's, and that after controlling for price inflation, increasing levels of teacher training and experience, and urbanization changes, teacher salaries in Minnesota are about 3% higher than their 1974-75 level, but still about 5% lower in real-dollar terms than their 1970-71 peak.
>
> On the other hand, the comparisons with other states show that teacher salaries nationally trended in a fairly similar manner over the past two decades, and that Minnesota teacher salaries continue to rank comparatively high, particularly when controlling for cost-of-living differences among the states.

Both of these descriptive statements are true and directly supported by the data. We leave the evaluation of these findings to the reader.

Perhaps the most important policy implication of this study concerns the possibility that there could be a repeat of the trends reported in this study. That is, with the current national economic situation and international military situation, the stage might be set for another cycle of erosion in the purchasing power of teacher salaries in Minnesota and the nation.

Should such a scenario unfold, there are some key differences between the current and past situations which might complicate matters.

First, given that Minnesota teachers now have the right to strike (since 1980), they might be less willing to tolerate any serious erosion of their real salaries in the 1990's;

Second, the fact that enrollments are currently increasing, rather than decreasing as during the 1970's, further strains state resources and exerts a constraining effect on the growth in the per pupil level of state aid; and

Third, by virtue of the fact that referendum levies are already being used to finance current operating costs in many school districts, there now may be a reduced capacity for comparable further increases in such levies. The referendum levy was an important fiscal tool which enabled many districts to keep pace with increasing teacher salaries during the 1980's.

In conclusion, while overall teacher salaries appear relatively healthy at this point in time and compared to other states, education policymakers cannot afford to be complacent about them. In the face of impending national economic uncertainty and state budgetary difficulties, the challenge for those concerned about teacher salaries will be to maintain the gains of the 1980's.

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Introduction

There has been increasing Legislative concern in recent years about the salaries of Minnesota's public elementary and secondary school teachers. This enhanced interest appears to have been stimulated by three principal factors: 1) a series of school spending studies by the Legislative Audit Commission; 2) increasing concern about the growing reliance on local referendum levies to finance schools; and 3) the sheer size of spending for teachers' salaries.

The series of reports by the Minnesota Legislative Audit Commission (LAC) dealt with educational expenditures generally.[1] Though these reports went far beyond the topic of teacher salary, per se, they were instrumental in highlighting the central role of salaries in educational costs and in documenting the role of salaries in driving recent cost increases. Their report also documented the 1974-1986 change in teacher salaries, both in actual and constant dollars.

However, the LAC cautioned that their trend analyses did not statistically control for the effects of either the increased training and experience of the teacher force nor for important staffing changes affecting the composition of the teacher workforce. Neither did those studies analyze teacher salary trends at the substate level to determine whether local salary differences are increasing or decreasing. The present study by House Research addresses these additional analytic needs, while extending the time frame of analysis to the most current year of data available.

The second factor working to enhance Legislative interest in the topic of teacher salaries has been the increasing reliance on local referendum levies to finance schools and the resulting public concern about the concomitant rising local property tax burdens. In the decade of the 1980's alone, referendum levies have grown exponentially, both in absolute terms and as a share of general revenue for schools.[2] For example, in 1981-82 131 districts levied $26.7 million in referendum levies, which amounted to 1.6% of general fund revenue statewide. By 1990-91 a total of $218.6 million was being levied by 273 school districts, amounting to an estimated 7% of general fund revenue. In two very small districts, currently the referendum levy amounts to more than 100% of the adjusted net tax capacity.[3] Hence, it is not surprising that taxpayers are increasingly concerned about the referendum levy, and that legislators would inquire about the root causes of rising educational expenditures.

---

[1] Trends in Education Expenditures, March, 1988 (LAC Report 88-05); Statewide Cost of Living Differences, January, 1989 (LAC Report 89-01); and School District Spending, January, 1990 (LAC Report 90-03).

[2] For a more detailed discussion of the referendum levy, see: Minnesota Senate Counsel & Research, Referendum Levies: Who Pays The Tax?. April, 1990.

[3] These districts are Strandquist (444) at 115% and Badger (676) at 103% of adjusted net tax capacity. These rates are based on gross certified levies, which are levies prior to the subtraction of property tax credits and aids. The third highest tax rate for referendum levy is 67% for Middle River (648).

The sheer amount of state spending for teachers' salary costs also makes it a topic worthy of legislative concern. Teacher salaries are an important component of the state budget: 31.7% of the $13.8 billion budget for the 1990-91 biennium, or $4.37 billion, consists of direct and indirect aids to school districts, and about half of school district expenditures are for teacher salaries. For the biennium, school districts will spend over $3 billion on teachers' salaries.

Questions Addressed In This Report

Consequently, the House Research Department was asked to perform a more in-depth analysis of teacher salary trends in Minnesota. Specifically, this report addresses the following questions.

- What have been the **trends in teacher salaries** over the past couple of decades?
- How have changing **school staffing patterns** impacted teacher salaries?
- When **controlling for price inflation**, what have been the trends in real dollar terms?
- When **controlling for changes in teacher training and experience**, what have been the salary trends?
- When **controlling for the increasing urbanization** in Minnesota, what have been the salary trends?
- Have there been important **substate variations** in teacher salary trends?
- How have the salaries of Minnesota's teachers **compared to those of teachers nationwide**?

Possible Questions For Future Research

This report is the second in a series of studies by the House Research Department on the topic of teachers' salaries. The first report uses a statistical method called cluster analysis to group districts into 10 groups or clusters based on their patterns of salary related factors. It is titled: Components of Teacher Salary Costs: A Cluster Analysis of Minnesota School Districts, (HRD Report, February, 1989). Subsequent reports in this line of inquiry will be directed to those researchable topics deemed of greatest interest and use to Legislators. They may address some of the following questions, which have not been addressed in the current report.

- What **district factors explain the differences in teacher salary levels among school districts** (e.g., district size, growth, decline, wealth, social class, and so on)?

- What have been the **trends in beginning teacher salary relative to the salaries of more experienced teachers**? Are the compensation levels for these two groups growing more alike or are they diverging? What are the implications for teacher recruitment and long-term retention?

- What have been the **trends in the use of local referendum levies to finance public school operations**? What has been the impact of these trends on the equity of educational opportunity? What types of districts are most likely to make use of the referendum levy for this purpose? What would be the cost to the state to equalize some portion of the referendum levy, and what would be the behavioral response of school districts to various levels of equalization.

- How has the **addition of many non-classroom teachers, especially special education teachers, affected overall salary levels**?

Chapter 1. Defining The Teacher Population

Types Of School District Staff

Different studies of teachers' salaries often use different definitions of "teacher". Some focus directly on full-time classroom teachers only, while others include part-time teachers, administrative staff, other licensed instructional support staff and occasionally even unlicensed support staff, or some combination of these groups. Some national compilations showing state by state salary rankings even appear to use different definitions for different states, probably reflecting the individual states' differing methods of collecting and storing salary data. Often, published salary studies are unclear regarding just which staff are included and which are not. Such vagueness and ambiguity can make it difficult and risky to compare findings between different studies and among different states. Data definitions can also be different within a single state at different points in time, thereby confounding comparisons across time. Thus, it is important to define the population of interest clearly and unambiguously for this study.

The Minnesota Department of Education (MDE) distinguishes between licensed and unlicensed school staff. Unlicensed staff include such categories of personnel as food service workers, bus drivers, custodians and clerical staff. Licensed staff, on the other hand, are categorized as shown below in Table 1.1 and illustrated in Figure 1.1.

Table 1.1
Categories Of Full-Time Licensed School Staff, 1988-89[4]

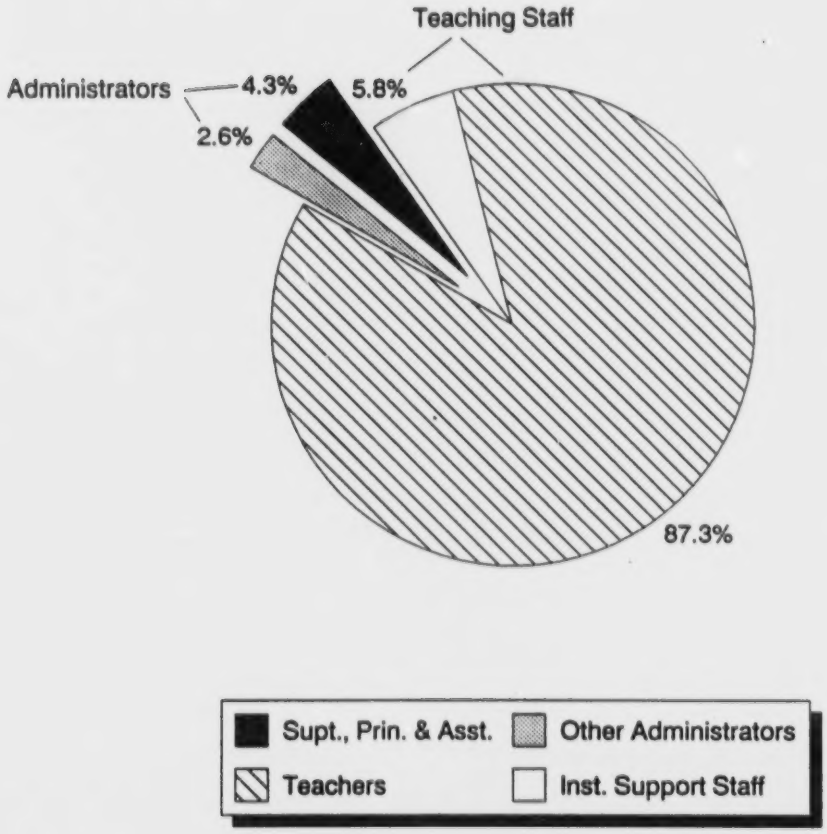
Assignment	Number	Percent
Superintendents, Principals & Assistants	1,951	4.3%
Other Administrators (Special Ed, Secondary Vocational & other)	1,166	2.6%
Instructional Support Staff [5] (Counselors, Librarians, Media Generalists & other)	2,608	5.8%
Teachers (Prekindergarten through secondary, & Special Ed)	39,400	87.3%
Total Full-Time Licensed Staff	45,125	100%

As indicated by the data in Table 1.1, teachers comprise the vast majority (87.3%) of full-time licensed school personnel. The remainder of licensed school personnel are divided roughly equally between all types of administrators (6.9%) and other instructional support staff (5.8%). Ideally, this study would focus solely on classroom teachers. However, the definition of the population of interest is limited by the availability of data, as noted in the following section.

[4] These figures represent licensed staff who are working full-time at the pre-kindergarten to senior high level. Hence, they differ somewhat from analyses based on full-time-equivalent figures, which include part-time staff, as well. See Table 1.2 for a listing of the case-selection criteria which were applied.

[5] Teachers (who have an assignment code prefix less than 90) and other instructional support staff (who have an assignment code prefix of 94) are typically paid on a step and lane grid (i.e., a salary schedule grid corresponding to years of experience and levels of formal training). Personnel with these assignment code prefixes but who have no step and lane are regarded for this study as temporary or hourly-wage personnel and have been excluded from the analysis.

Figure 1.1
Categories Of Full-Time Licensed School Staff: 1988-89



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Availability Of Teacher Salary Data

The principal source of salary data for licensed school staff in Minnesota is the Licensed School Personnel Records Data Base maintained by the Minnesota Department of Education. Each fall, Minnesota's 435 school districts report to the Department relevant salary and assignment information for each licensed staff person that they employ. The data include such items as an ID number for the district and the teacher, the teacher's step and lane, years of experience, training level, gender, age, percentage full-time equivalent, all assignment information and annual salary. This salary information refers only to base salary; it does not include any additional compensation paid for supervision of extracurricular or co-curricular activities, nor does it include any benefits.

Given the biennial budgeting cycle and consequent timing of contract negotiations, the reported salary data are much more accurate in the even/odd school years (e.g., 88-89) than in the odd/even years (e.g., 89-90). Even then, however, unusually late contract settlements may not always be reflected in the data base. In addition, districts often differ in their reporting of salaries of part-time staff, with some reporting the actual part-time salary and others seemingly reporting the full-time equivalent salary; frequently it is unclear which has been reported since step and lane information is not available for part-time staff.

MDE's Licensed School Personnel Records Data Base dates to the 1974-75 school year. However, the information is complete only since the 1981-82 school year. For school years 1974-75 and 1980-81, no step and lane information is available, making it difficult to distinguish between permanent and temporary licensed staff. Also for all years prior to 1980, no assignment information is available, making it impossible to distinguish between classroom teachers and the majority of non-administrative instructional support staff and the few administrators who also have a step and lane.

It should be noted that these limitations of the early years of the Licensed School Personnel Records Data Base (i.e., for the school years 1974-75 through 1980-81) date to the era in which this data was maintained by the Minnesota Department of Administration (i.e., the Information Systems Bureau, as their computer center was then called). The quality and completeness of the data was improved considerably when it came under the control of the Education Department in 1982. Nevertheless, the limitations detailed above have serious implications for the present study; particularly for the operational definition of the population of interest, which is specified in some detail in the following section.

Criteria For Case Selection

Given the above-stated limitations of the Licensed School Personnel Records Data Base, the population of interest must be defined as including both classroom teachers, per se, and other non-administrative instructional support staff (i.e., the 3rd and 4th groups in Table 1.1). Administrative personnel are excluded, as are teachers and instructional support staff who are working only part-time or on a temporary (i.e., hourly wage) basis or who are inactive (i.e., on leave), those with a post-secondary teaching assignment (i.e., in a vocational school) and those showing a grossly miscoded salary. The criteria for rejecting cases from

the data base are listed below in Table 1.2, along with the corresponding operational definitions.

Table 1.2
Case Rejection Criteria And Operational Definitions

Rejection Criterion	Operational Definition
Administrative	For 1980 to present: the Assignment Code is greater than 90-0000, except for the range 94-0000 to 94-9999. For years prior to 1980: no step & lane codes only.[6]
Part-Time	Those working less than 35 weeks or less than 97% time (to allow for rounding error for those with multiple assignments).
Temporary/ Hourly Wage	Non-administrative, licensed staff with no step and lane data.
Post-Secondary	Grade level of the assignment is coded as 13 or 20.
Inactive	Employment status is coded as 20 or greater (e.g., leave for maternity, military, extended illness, professional growth, extended travel, etc).
Grossly miscoded salary	Stated salary is less than the district's salary for a starting teacher (i.e., lane 3, step 1;)[7]

[6] Assignment code information is used to distinguish between administrators and other licensed school staff for all years for which such data is available; i.e., for 1980-81 to the present. However, no assignment data is available prior to 1980. Thus, for earlier years we use step and lane codes as a proxy identifier. This is possible since the vast majority of school administrators (i.e., persons with an assignment code prefix greater than 90, but not equal to 94) are not paid on a step and lane grid.

[7] Information about districts' starting salaries was obtained from reports of the Minnesota School Boards Association, supplemented directly by the MSBA to provide information otherwise missing from the published reports. See: Minnesota School Boards Association, Licensed Salaries and Related Information. Annual report.

The Resulting Sample Of Teachers And Support Staff

Table 1.3 and Figure 1.2 show the effects of applying the sample selection criteria to the Department's Licensed Staff data file for one year.[8] Eliminated from the analysis are 10,884 licensed staff who fail to meet the sample-selection criteria above (20.6%); of these, 3,117 cases were rejected because they are full-time administrators, even though they otherwise meet the selection criteria. This leaves for analysis 42,008 full-time teachers and instructional support staff, 79.4% of the total number of licensed staff records on the tape for that year. Of this number, 39,400 (93.8%) are teachers and 2,608 (6.2%) are instructional support staff.

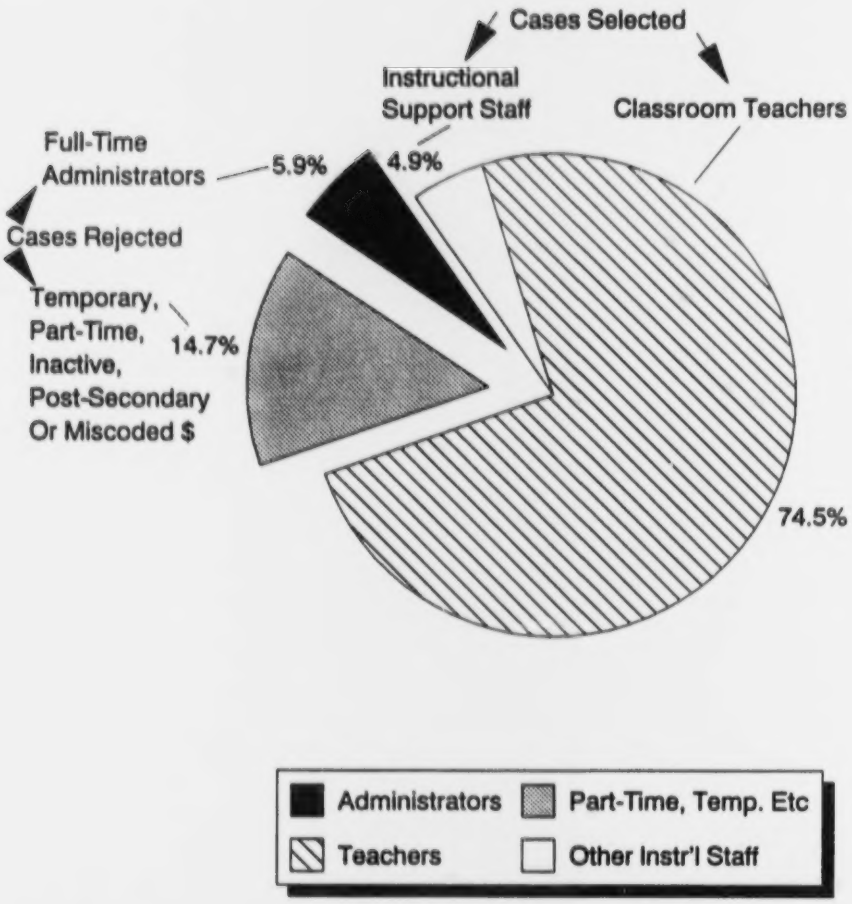
Table 1.3
Effects Of Applying The Case-Selection Criteria
To All Licensed School Staff: 1988-89

Category of Licensed Staff	Number	Percent
Total Licensed Staff (including those who do not meet selection criteria for this study)	52,892	100%
Staff Rejected For Failing Selection Criteria		
Part-time, Temporary, Post-Secondary, Inactive or Salary Miscoded	7,767	14.7%
Full-time, Active Administrators	3,117	5.9%
Total Cases Rejected	10,884	20.6%
Staff Meeting All Selection Criteria		
Teachers	39,400	74.5%
Instructional Support Staff	2,608	4.9%
Total Cases Selected for Analysis	42,008	79.4%

It is important to reiterate that this population is somewhat broader than desired, since it contains instructional support staff in addition to teachers per se. As explained earlier, this mixture is necessitated by the lack of information to distinguish between the two groups in the earlier years' data. Thus, the inclusion of instructional support staff for all years of data will enhance the validity of the trend analysis. However, since instructional support staff often have more training and experience, and therefore higher salaries, than teachers

[8] Unlike the figures presented earlier in Table 1.1 and Figure 1.1 which included only full-time staff, the data presented here reference all full-time and part-time licensed school staff.

Figure 1.2
Effects Of Applying The Case-Selection Criteria
To All Licensed School Staff: 1988-89



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($3,178 higher, on average, in 1988-89), the average salary reported for any given year will be inflated (by approximately $190 in 1988-89) over the average that would apply to teachers only.[9] The reader is cautioned to be mindful of this and the other selection criteria when comparing the salary averages reported in this study to those reported elsewhere.

Time Frame Of The Study

It is commonly claimed that the high water mark for the purchasing power of teacher salaries prior to the current time occurred in approximately 1970-72 in most states.[10] This is immediately prior to the nearly decade-long period of major economic upheaval marked by the 1973 oil embargo and subsequent energy crisis, along with the rampant price inflation and federal fiscal management difficulties during the remainder of the 1970's.

Using published figures from the National Education Association (NEA)[11], Table 1.4 and Figure 1.3 reveal that in Minnesota teacher's purchasing power peaked in 1970-71. Ideally then, the time frame for the present study would date to 1970-71 or earlier. However, we are limited to a 1974-75 start for the detailed trend analysis due to unavailability of case-level data prior to 1974-75. The data of Table 1.4 indicates that by 1974-75 the purchasing power of teachers' salaries in Minnesota had already eroded by approximately 8.3% percent from its peak in 1970-71.

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[9] The effect of this salary difference on the overall average salary figure is mitigated by the fact that there are about 15 times more classroom teachers than other instructional support staff.

[10] See, for example, F. Howard Nelson, Survey and Analysis of Salary Trends. Washington, D. C.: American Federation of Teachers, 1989: 28-39.

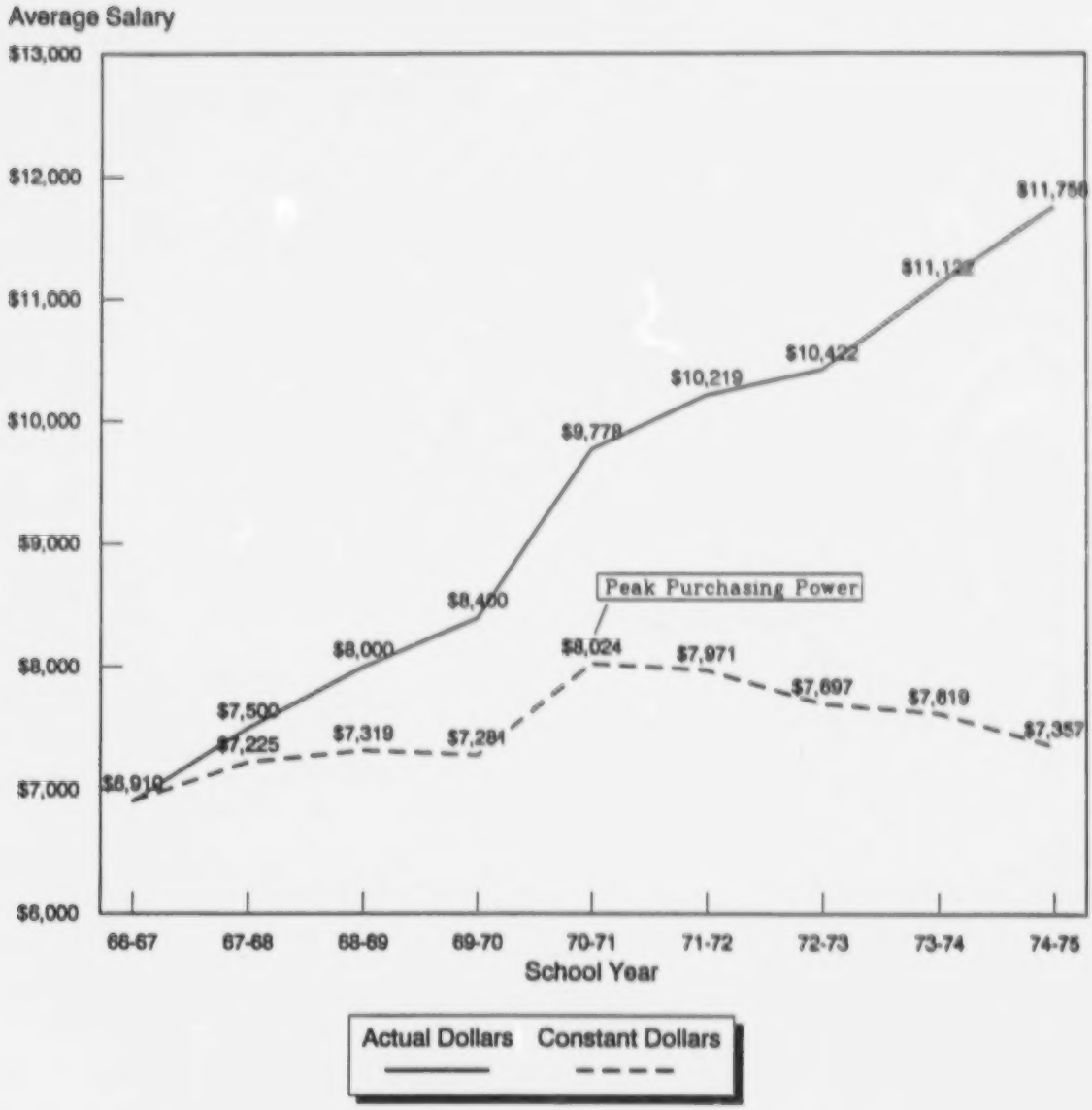
[11] Data source: National Education Association, Ranking of the States. Annual Series. NEA, Estimates of School Statistics. Annual series. These figures were initially provided to the NEA from Minnesota's Licensed School Personnel Records Data Base then maintained by the Department of Administration. However, the raw data upon which they are based cannot be located and probably no longer exists. Given the impossibility of applying our case selection criteria to NEA's published figures, they cannot be used to extend our trend analysis to years earlier than 1974. Nevertheless, NEA's aggregate figures are sufficiently suggestive of salary trends to be useful in establishing the timing of the teachers' purchasing power peak.

Table 1.4
Establishing The Peak Of Teachers' Purchasing Power:
Teachers' Salaries And The Implicit Price Deflator: 1966 - 1974

	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
Teacher Salary									
Average	$6,910	$7,500	$8,000	$8,400	$9,778	$10,219	$10,422	$11,122	$11,756
Percent Change		8.5%	6.7%	5.0%	16.4%	4.5%	2.0%	6.7%	5.7%
GNP Implicit									
Price Deflator[12]	34.45	36.80	38.75	40.90	43.20	45.45	48.00	51.75	56.65
Percent Change		3.8%	5.3%	5.5%	5.6%	5.2%	5.6%	7.8%	9.5%
Average Teacher Salary									
in Constant 1966 Dollars	$6,910	$7,225	$7,319	$7,281	$8,024	$7,971	$7,697	$7,619	$7,357
Percent Change from Peak						-0.7%	-4.1%	-5.0%	-8.3%

[12] Data source: Economic Report of the President. Washington, D. C.: U.S. Government Printing Office, 1989: Table B-3, 312-313.

Figure 1.3
Establishing The Peak Of Teachers' Purchasing Power:
Teachers' Salaries In Actual And Constant Dollars: 1966-1974



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Chapter 2. Relevant School Staffing Trends

Any major changes in the size and composition of the teaching force will affect aggregate measures of teacher salaries for two reasons: first, the salaries of teachers are based on their levels of training and experience; and second, the majority of both teacher hirings and layoffs involve primarily young professionals with less than average levels of experience and training. Thus, a brief review in this chapter of some relevant developments in school district staffing patterns will provide a helpful background for understanding the analysis of teacher salary trends which will be presented in the following chapter.

It is widely acknowledged that one of the most dramatic phenomena affecting the size of the teaching force in recent decades has been the demographic bulge of post-World War II "baby boomers" progressing into and through the school system. While the time period for this bulge is somewhat subjectively framed, most observers define it as having begun with the kindergarten class of about 1950 and having concluded with the high school graduating classes of the late-1970's, with the peak of the bulge occurring around 1970. As the baby boomers reached adulthood, they themselves gave rise to the equally acknowledged "baby boomlet" bulge of school-aged children having a less well defined time frame; however, it is generally regarded as having begun in the mid-to-late 1970's and is still working its way through the system with the leading edge now approaching adulthood themselves.[13]

Another factor affecting public school enrollments and, hence, school staffing patterns has been the decreasing reliance on private school education, particularly private parochial schools. The percentage of Minnesota's students attending private schools peaked at 18.7% in 1959-60, after which the rate declined sharply until bottoming out at 9.1% in 1974-75. For the next nine years, the private school participation rate gradually increased until peaking again in 1984-85 at 11.1%; since then, it has again been gradually declining.[14] There has been considerable debate regarding the reasons for this decline, though most experts cite both demographics (i.e., the population shift to suburban and exurban areas far from the typically inner-city private schools) and changing religious values (i.e., with parents being less willing to send their children to parochial schools, as well as the reduced availability of religious personnel as teachers and their replacement by more-costly lay teachers). For whatever reasons, the result has been a gradual shift of tens of thousands of school children into the public school system, increasing the numbers of public school staff over the levels which otherwise would have existed.

Some of the developments affecting school staffing patterns have been more directly policy based. One important policy development has been the mandate regarding services for learning disabled and other handicapped students, resulting in the relatively strong growth, dating at least to the early 1970's, in the number of special education teachers in

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[13] The Brookings Institution, Historical Statistics of the United States: Bicentennial Edition. Washington, D.C.: 1982; see Chapters 2 and 3.

[14] Data source: Minnesota Department of Education, Education Statistics Division, Information on Minnesota Nonpublic Schools for 1986-87.

Minnesota's public schools. This development has been thoroughly documented and discussed in a recent report by the Legislative Auditor.[15]

Perhaps the most important recent policy development affecting school staffing patterns in Minnesota involves the myriad of responses to the state fiscal crisis stemming from the national economic recession beginning in 1980. As that recession deepened and drove state tax revenues further and further below forecasts, Governor Quie (1979-1983) called one special legislative session after another to deal with the worsening budgetary situation.[16] While no functional areas were immune to budgetary cuts, the education finance rollbacks were particularly noteworthy. During the course of the fiscal crisis, state school aid funds were unallotted, delayed to shift payments to the following biennium, and reduced to shift part of the burden from the state to the local property tax.[17] Concurrent with the various school budgetary cuts, teachers increasingly were demanding large salary settlements to compensate them for the losses in purchasing power which they suffered during the latter half of the 1970's, as well as to buffer against the expectation of continuing high economic inflation.[18] School district responses to this squeeze on their budgets included spending reserves where possible and increasing local discretionary levies, as well as school closings,[19] widespread and often drastic program cuts, and staff layoffs.[20] Several districts

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[15] Minnesota Legislative Audit Commission, School District Spending. January, 1990 (LAC Report 90-03).

[16] There were three Special Sessions in 1981 and one in 1982, in addition to the regular legislative sessions for those years.

[17] For a more thorough review of the various policy responses to the state fiscal crisis accompanying the nation economic recession of 1980-82, see: Charles H. Sederberg, Chronology of Minnesota's Fiscal Crisis July 1, 1979 through December 31, 1982. Occasional Paper Number 1, January, 1983; and State Revenue Shortfalls and Resource Allocation For Minnesota Elementary/Secondary Education During the 1981-83 Biennium. Occasional Paper Number 2, February, 1983. Minneapolis, MN: Center for Education Policy Studies, University of Minnesota.

[18] For example, see: "Prices Stay a Step Ahead of Teachers' Pay", Minneapolis Star, June 9, 1981; "Brandon Teachers Ask For 55 Percent Increase" and "Evansville Teachers Seek 48 Percent Salary Increase", the Alexandria Lake Region Press, June 19, 1981.

[19] "Proposed School Closings Echo Through District", Minneapolis Star Tribune, January 12, 1982.

[20] See, for example: "Some School Districts Forced to Make Drastic Cuts", Minneapolis Tribune, March 18, 1982; and "Cutbacks Vary In Minnesota", Fargo Forum, May 2, 1982.

laid off up to one-fourth of their teachers.[21] Statewide, teacher layoffs for the 1982-83 school year were estimated to total 4,000 to 6,000.[22]

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[21] See, for example: "Suburb (Mounds View) To Trim 190 Teachers", St. Paul Dispatch, February 25, 1981; "25% Cut in Teachers Possible at Sauk Centre", Minneapolis Star Tribune, March 5, 1982; and "Minnetonka School District to Lay Off 23% of Its Teachers", Minneapolis Star Tribune, April 5, 1982. The actual teacher layoffs, though substantial, were somewhat less than predicted, as reflected in the full-time equivalent data from Profiles: for example, Moundsview, 140 out of 741 (19%); Sauk Centre, 17 out of 92 (18%); and Minnetonka, 81 out of 386 (21%).

[22] "Survey Sets Teacher Layoffs Near 5,000", St. Paul Pioneer Press, July 8, 1982.

Table 2.1 and Figure 2.1 present relevant enrollment and staffing data for the period 1974-88. These statewide data reflect the combined effects of the demographic trends and policy decisions discussed above. The data in Row A reflect the steady decline in enrollments associated with the last of the baby boomers passing out of the schools, with enrollments bottoming out in the 1984-85 school year, followed by increases associated with the baby boomlet generation making its way through the elementary grades.

The data of Row C reveals that the size of the state's teacher force may be more closely tied to budgets than to enrollments, since it increased somewhat in 1976-77 before declining, and since most of the decline occurred between the 1980-81 and 1982-83 school years, coincident with the prolonged state fiscal crisis occurring at that time. This sharp retrenchment in staffing can be expected to simultaneously result in a rather sharp increase in the average salary of the teacher force, since it is likely that the workforce cuts would disproportionately affect newer, lower-paid teachers, both through their being the most likely candidates for layoff and through a reduction in new hirings. This reasoning is supported by the data of Rows D and E, showing a one period increase in staff rehirings in 1982-83 (thus cutting the number of new hirings by over two-thirds), and by the sharp jump in the average years of experience of the teacher force in 1982-83.

Table 2.1
School Enrollment And Staffing Data: 1974-1988[23]

	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
A. School Enrollments[24]								
PK & Elementary	436,338	413,112	419,956	371,828	351,386	350,989	378,853	407,425
Secondary	448,310	443,852	413,355	379,545	359,585	344,787	329,593	314,921
Total	884,648	856,964	803,311	751,373	710,971	695,776	708,466	722,346
B. Pupil/Staff Ratio[25]	17.1	16.9	16.2	15.2	16.0	15.5	15.2	15.0
C. Number of Teachers And Instructional Support Staff	43,817[26]	47,213	44,361	42,963	38,684	39,127	40,677	42,008
D. Percent Rehired From Previous Year	93.0%[27]	92.5%	93.0%	91.9%	97.5%	93.2%	93.2%	94.0%
E. Average Years of Experience	—[28]	13.8	14.4	14.5	15.9	16.5	16.6	16.9

[23] Unless otherwise noted, these figures are based upon our analysis of the MDE's Licensed Personnel Data Base.

[24] Minnesota Department of Education. Untitled enrollment document.

[25] Minnesota Department of Education, School District Profiles. Published annually. The denominator for this ratio is the number of full-time-equivalent (FTE) professional staff, rather than the number of full-time teachers and instructional support staff (excluding administrators and part-time teachers) shown in the following row of this table.

[26] Due to missing information from the 1974-75 data base for the key variables used to distinguish types of school personnel (i.e., teaching assignment and salary step and lane), the teacher count figure was substituted from the Digest of Eduction Statistics, U.S. Department of Education, National Center for Education Statistics. The reader is cautioned that the NCES data definition differs somewhat from the definition used in this report and detailed in Chapter 2. A comparison of figures from the other years, in which data is available from both sources, suggests that the NCES figures may differ by 1,000 or more teachers.

[27] Again due to missing information, this figure could not be computed directly. The substituted figure is based on administrators in addition to teachers and other instructional support staff. For years in which comparisons can be made, the percentage rehired figures are virtually identical for these groups.

[28] Again, missing information prevents the direct calculation of this figure.

Figure 2.1
School Enrollment And Staffing Data: 1974-1988

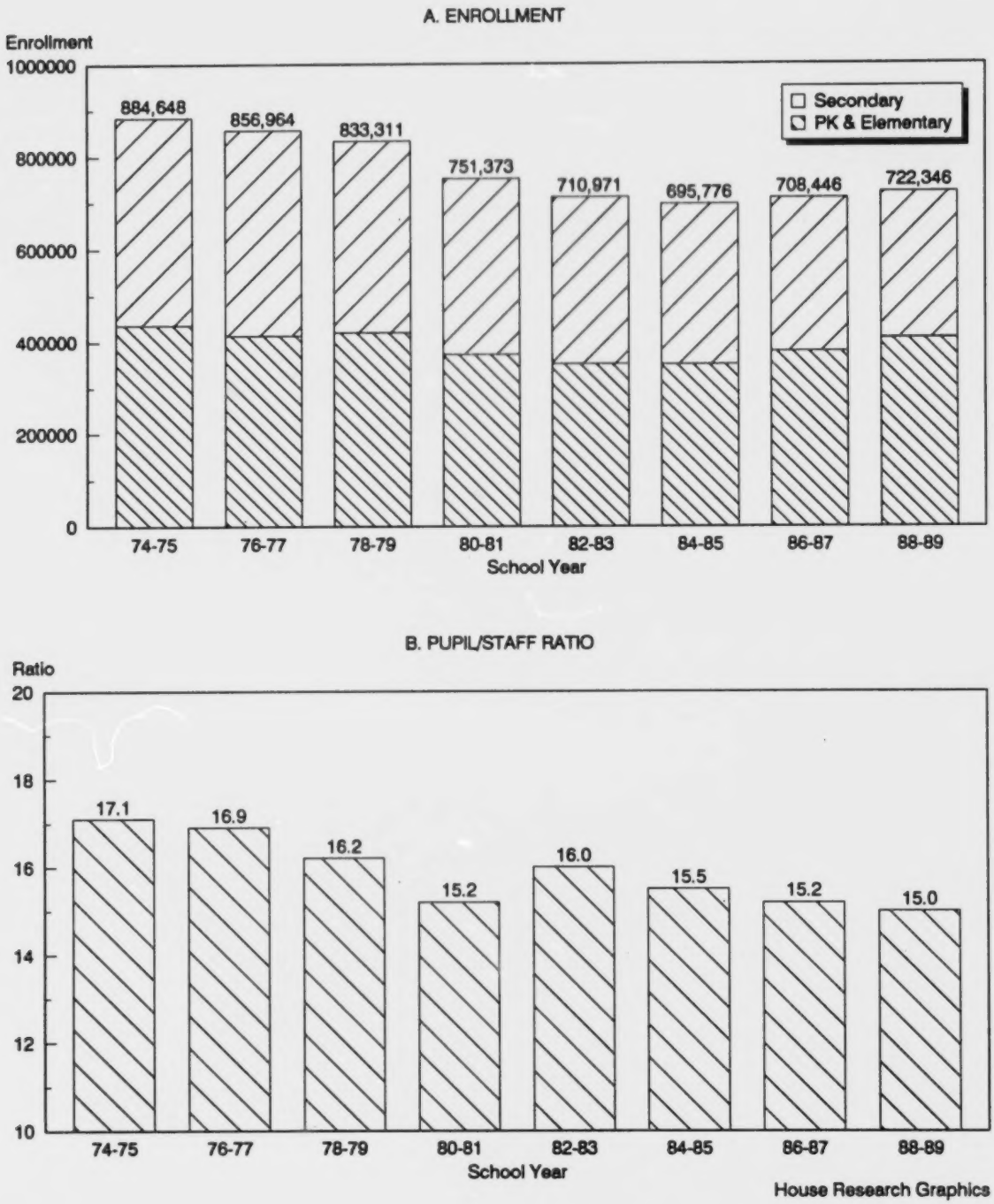
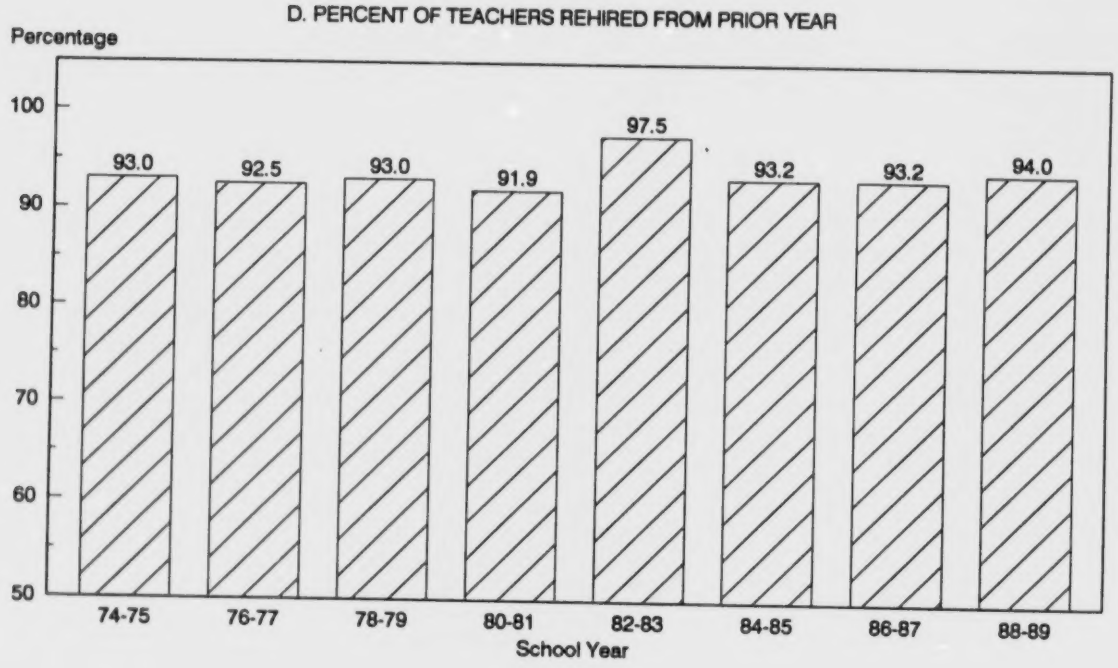
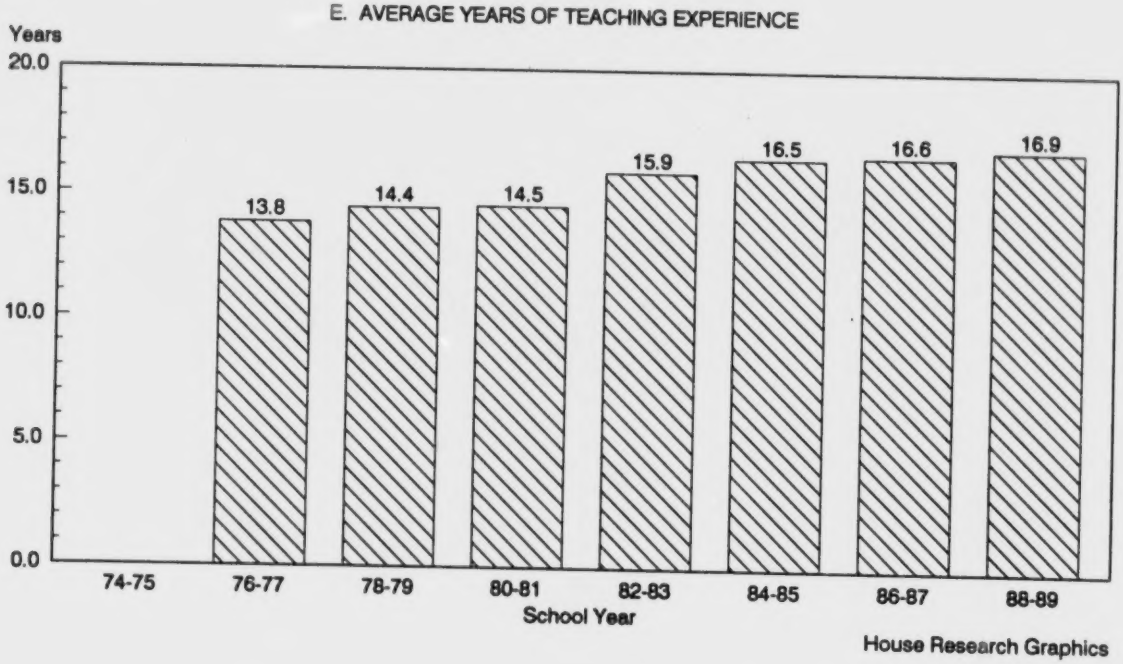


Figure 2.1 Continued
School Enrollment And Staffing Data: 1974-1988





Chapter 3. Statewide Teacher Salary Trends

This chapter addresses the central questions of this study: what has been the trend in teacher salary levels in recent decades, and what factors underlie these trends? We first present the statewide average teacher salary trend figures expressed in nominal dollars, and then in constant 1974 dollars to control for price inflation during the 14-year study period, followed by additional salary trend figures controlling for changes in teacher training and experience, as well as for increasing urbanization of the teacher force.

The Trend In Nominal Dollars

Table 3.1, Row A presents the statewide average teacher salary figures for the time frame of this study. During this fourteen-year period, teacher salaries have increased from an average of $12,214 to $31,421; this represents an increase of 157.3%, leaving 1988-89 salaries somewhat greater than two and one-half times their 1974-75 level on average. On the surface, it would appear that teachers' compensation has grown very handsomely during this time period. However, before any such conclusions can be drawn, it is important to control for the effects of price inflation, which was also substantial during the much of this time.[29]

Controlling For Inflation: Constant Dollars

Table 3.1, Row B presents the statewide average teacher salary figures after adjustment for price inflation.[30] These adjusted figures represent teacher salaries in constant 1974-75 dollars. They show teacher purchasing power increasing slightly (3.2%) during the first 2-year interval, then decreasing somewhat during the two subsequent 2-year intervals (i.e., -4.0% and -4.3%), so that by 1980-81 the inflation-adjusted teacher salaries were 5.2% below their level of 1974-75. These decreases in teachers' spending power occurred as the result of price inflation and despite the significant nominal salary increases noted above; in short, rising salaries during this period simply could not keep pace with still faster rising prices. As will be discussed later in Chapter 5, this situation was systemic and characterized most occupational groups in America during the latter half of the 1970's.

Between 1980-81 and 1982-83, however, teachers' inflation-adjusted salaries rebounded considerably (by 11.5%), moving to 5.8% above their 1974-75 level. This too needs further interpretation. Approximately one-fourth of this increase in the inflation-adjusted average teacher salary is due to some rather abrupt teacher force changes which occurred in 1981. As discussed in Chapter 2, the statewide teaching force was reduced by roughly 4,000 persons from 1980-81 to 1982-83. This reduction occurred almost entirely through either the decreased hiring of new teachers or the laying-off of less-experienced teachers. In either

[29] The salary trend figures discussed in this chapter, as well as related information regarding staffing changes which affect salaries, are summarized in Appendix A.

[30] Appendix B documents the procedure used to adjust for the effects of price inflation.

Table 3.1
Minnesota Teacher Salary Trends: 1974-1988

	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
A. Average Salary	**$12,214[31]**	**$14,511**	**$16,117**	**$18,374[32]**	**$23,251**	**$26,058**	**$29,065**	**$31,421**
Percentage Change From Prior Period	—	18.8%	11.1%	14.0%	26.5%	12.1%	11.5%	8.1%
Percentage Change Since 1974-75	—	18.8%	32.0%	50.4%	90.4%	113.3%	138.0%	157.3%
B. Price-Adjusted Average Salary	**$12,214**	**$12,608**	**$12,109**	**$11,585**	**$12,920**	**$13,506**	**$14,229**	**$14,378**
Percentage Change From Prior Period	—	3.2%	-4.0%	-4.3%	11.5%	4.5%	5.3%	1.1%
Percentage Change Since 1974-75	—	3.2%	-0.9%	-5.2%	5.8%	10.6%	16.4%	17.7%
C. Training & Experience Adjusted Avg. Salary	**$12,214**	**$12,277**	**$11,490**	**$10,718**	**$11,640**	**$11,953**	**$12,576**	**$12,632**
Percentage Change From Prior Period	—	0.5%	-6.4%	-6.7%	8.6%	2.7%	5.2%	0.4%
Percentage Change Since 1974-75	—	0.5%	-5.9%	-12.2%	-4.7%	-2.1%	3.0%	3.4%
D. Urbanization-Adjusted Average Salary	**$12,214**	**$12,302**	**$11,506**	**$10,764**	**$11,647**	**$11,964**	**$12,509**	**$12,545**
Percentage Change From Prior Period	—	0.7%	-6.5%	-6.4%	8.2%	2.7%	4.6	0.3%
Percentage Change Since 1974-75	—	0.7%	-5.8%	-11.9%	-4.6%	-2.1%	2.4%	2.7%

[31] This number is an estimate; see Appendix A for an explanation of the methodology used.

[32] This figure is also an estimate, albeit much more tied to the actual individual-level teacher data than is the estimate for 1974-75. Again, see Appendix A for an explanation.

case, the affected positions were generally the lower-paying positions. For each such lower-paying position eliminated, the average salary figure would increase since the remaining teachers are the more-experienced and thus higher-paid people. As also noted in Chapter 2, this abrupt effect associated with the relatively sudden change in the composition of the teaching force occurred on top of the longer-term trend toward a more experienced and more educated teacher force.[33]

During the 1980's, the inflation-adjusted teacher salaries increased in each biennium, by a rough average of 5% per biennium through the 1986-87 school year, and by 1.1% during the following biennium. Thus, despite incurring a significant loss of purchasing power in the latter part of the 1970's, teachers' inflation-adjusted salaries recovered enough during the 1980's to place them fully 17.7% higher by the 1988-89 school year than their level for the 1974-75 school year. Again, however this statistic is subject to misinterpretation until the salary effects associated with the aging of the teaching force have been factored out.

Controlling For Changes In Teacher Training & Experience

Row C of Table 3.1 presents the inflation-adjusted average salary figures after controlling for the effects of increasing teacher training and experience.[34] Since the trend throughout the time-frame of the study has been toward increased teacher training and experience, adjusting for this factor will decrease the inflation-adjusted salary figures for each year beyond the starting year. The magnitude of the adjustments, as reflected in the differences between the adjusted salary figures of Row C and Row B, reveal that increasing training and experience has been a significant factor in driving teacher salary increases during this period. When the salary gains associated with increased training and experience of the teacher force are factored out, we find that teachers' purchasing power declined sharply during the 1970's, so that by 1980-81 the average salary was fully 12.2% lower than in 1974-75.[35] Not until 1986-87 did the adjusted average salary match its level of 1974-75. Overall, the data of Row C reveals that after adjustments for both price inflation and teacher training and experience growth, the statewide average teacher salary figure increased 3.4% between 1974-75 and 1988-89. This compares to an increase of 157.3% in the unadjusted or raw average salary (Row A), and to an increase of 17.7% in the inflation-adjusted average salary (Row B).

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[33] This phenomenon toward increased training and experience of a teacher force is generally referred to as the "aging" of the teacher force since it is often, but not necessarily, associated with a teacher force in which the average age is increasing over a period of years. Factors which could result in an aging teacher force include: 1) a decrease in the hiring of new teachers, as often occurs with budgetary austerity or declining enrollments; 2) increased retention of older teachers, as may result from long-term improvements in health care, retirement age changes, or general economic situations which discourage retirement; and 3) increased availability of, or desire for, the continued education of teachers, unrelated to chronological age itself.

[34] Appendix C documents the procedure used to adjust for the effects of teacher training and experience changes.

[35] This erosion of teacher salaries amounted to roughly 20% since their peak in 1970-71, when also considering the 8.3% loss in purchasing power which occurred between 1970-71 (the peak year for teachers salaries) and 1974-75 (the beginning data year of this study). (See Table 1.4 in Chapter 1.)

Alternatively phrased, of the nominal increase of $19,207 in the statewide average teacher salary during the 14-year period between 1974-75 and 1988-89, approximately $17,043 has been due to price inflation, while approximately another $1,746 has resulted from increased teacher training and experience levels. The remaining portion of the increase in average salary, $418, could be interpreted as a true increase in teacher compensation provided that other factors are not identified as driving it.

Controlling For Urbanization Of The Teacher Force

One such factor might be increased urbanization of the teaching force.[36] This hypothesis is based on the following reasoning: Since teachers in urban areas of Minnesota receive higher salaries that generally reflect their higher cost of living, a growth in the proportion of teachers employed in urban areas could help to produce a higher statewide average teacher salary.[37] Such "urbanization" of Minnesota's teacher force could result from either the movement of teachers from rural to urban areas of the state or the enlargement of urban areas through urban sprawl.

In order to test this hypothesis, a measure of urbanization of the state's teacher force was developed for each year.[38] Row D of Table 3.1 presents the average teacher salary figures after adjustment for changes in urbanization of the teacher force; this adjustment is in addition to those for price inflation and teacher training and experience discussed above. The findings regarding the effect of urbanization are rather surprising. Overall, after controlling for the effects of price inflation and increased training and experience, urbanization accounts for less than 1% of the increase in teachers' salaries during the time frame of this study. In fact, for most of the 14-year interval, changes in the urbanization of the state's teacher force actually had the effect of slightly decreasing, rather than increasing, the statewide average salary of teachers; only since 1986-87 has this factor begun to exert upward pressure on average salaries. This requires some explanation.

Clearly, there is very little empirical support for the hypothesis that average statewide teacher salaries are increasing in part as a result of an increasing concentration of the state's teachers into urban areas; the only supportive evidence is found during the latter half of the 1980's, and even then it is minimal. The reason is that the hypothesized concentration of teachers in urban areas has not occurred, at least not yet. As documented in more detail in Chapter 2, the sharp decline during the 1970's in the numbers of students (and, hence,

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[36] In an analysis of teacher compensation among a sample of small to medium sized Wisconsin school districts, the percentage of population living in urbanized areas in the school district was found to be a very strong and positive predictor of teacher salary level. See: Dennis C. Zuelke, "Teachers' Probability of Economic Rewards Through Collective Negotiations: The Wisconsin Studies, 1972-73 and 1979-80.", Journal of Education Finance, 10 (Winter, 1985): 375-388.

[37] The Legislative Audit Commission has reported that outstate teacher salary schedules are about 9% lower than those in the metro area. See: Statewide Cost of Living Differences, January, 1989 (LAC Report 89-01).

[38] Appendix D presents our methodology for measuring urbanization of the teacher force.

teachers) in central city and first-ring suburban school districts more than offset the rural to urban shift of students (and teachers) occurring through the urbanization of outlying regions of the seven-county metro area and of the Twin Cities to St. Cloud and Twin Cities to Rochester corridors.

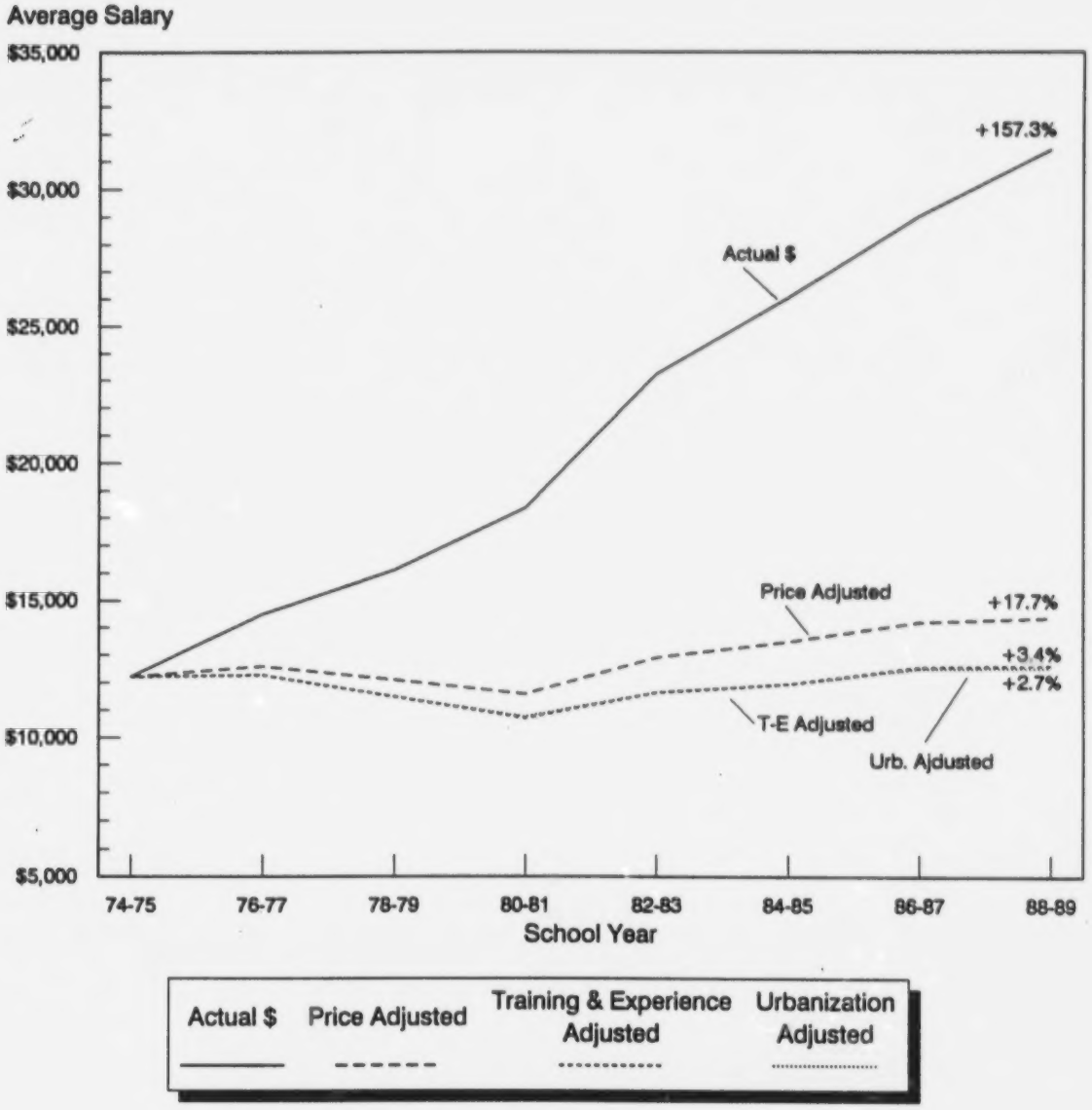
Thus, urbanization of Minnesota's teacher force has not been found to be an important determinant of teacher salary increases because, despite continuing urban sprawl, the concomitant concentration of teachers into urban areas has not occurred to any appreciable extent during the time frame of this study. Nevertheless, this factor might become an important salary determinant in the not too distant future. Since enrollments in most urban districts are again on the rise, and because the metropolitan area continues to sprawl, a considerably greater proportion of the state's teacher force is likely eventually to be working in higher-cost urban areas and demanding urban-level rates of compensation. In this manner, urbanization will tend to drive up the average and total teacher salary figures without necessarily increasing teachers' living standards, thereby exacerbating the tensions associated with the conflicting perceptions of sharply escalating school salary costs on the part of the public and stagnating living standards on the part of the teachers.

Summary Of Statewide Salary Trends

In summary, the data of Table 3.1, which are illustrated in Figure 3.1 below, reveal that during the 14-year period of this study (i.e., between 1974-75 and 1988-89), the statewide average teacher salary increased from $12,214 to $31,421, an increase of $19,207 or 157.3%. However, after controlling for price inflation, the increase amounts to only $2,164, or 17.7% (i.e., from $12,214 to $14,378 in 1974-75 nominal dollars). After also controlling for the effects of increased teacher training and experience levels, the increase amounts to only $418, or 3.4% (i.e., from $12,214 to $12,632 in 1974-75 nominal dollars). After also controlling for the effects of a small shift toward the urbanization of the teacher force, the remaining $331 or 2.7% increase in the average salary (i.e., from $12,214 to $12,545 in 1974-75 nominal dollars) is interpreted as a true increase in teacher compensation.[39]

[39] To put this in perspective, the reader is reminded once again that the time frame of this study does not reach back to zenith of purchasing power for teachers' salaries, which in Minnesota occurred during the 1970-71 school year. Between 1970-71 and 1974-75, the beginning period of this study, the purchasing power of teachers' salaries declined by and estimated 8.3% (See Chapter 2 for this analysis and discussion). If we were able to control for the effects of increasing training and experience during that 4-year period, it is likely that such decline would be found to be somewhat greater than this figure.

Figure 3.1
Teacher Salary Trends Before And After Adjustments: 1974-1988



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Chapter 4. Substate Variations In Salary Trends

It is common knowledge that teachers' salaries are generally higher in the Twin Cities area than in the nonmetro areas of Minnesota. Using 1986-87 data, the Legislative Auditor concluded that, after controlling for differences in teacher training and experience, metro-area salary schedules are about 9% higher than those in outstate areas.[40] However, it has not been shown whether such salary differences are changing in any systematic manner; that is the purpose of this chapter.

The previous chapter analyzed teacher salary trends on a statewide basis. This chapter analyzes teacher salary trends at the substate level to determine whether salary differences among groups of school districts are increasing, diminishing or holding constant. For this analysis, teachers are grouped in two different ways: 1) by school district clusters (described below); and 2) by geographic regions.

Salary Trends By School District Clusters

In an earlier House Research study,[41] Minnesota's school districts were grouped into 10 groups or clusters based on their patterns of teacher salary and benefits costs per pupil and four additional teacher-related factors that affect those costs: salary schedule, training levels, experience levels, and pupil/teacher ratio. Ten clusters of school districts emerged from that analysis; they are summarized in Table 4.1 and illustrated in Figure 4.1. Each cluster represents a unique teacher salary situation found in Minnesota school districts. These clusters illustrate both the similarities and differences underlying school districts' total teacher salary costs per-pupil; an interpretation of them appears in the original report. In the present study, these ten clusters are merely used as a convenient grouping device to determine whether or not teacher compensation levels are growing more disparate among different types of districts.

Table 4.2, Part A presents the average teacher salary figures for each of the ten clusters for the 12-year period beginning in 1976-77. To facilitate comparisons across years, Part B of Table 4.2 expresses each average salary figure from Part A as the percentage of the corresponding year's statewide average salary figure. However, as noted in Part C of Table 4.2, the ten school district clusters differ markedly in their levels of teacher training and experience. Thus, Part D re-expresses each average salary figure in Part A as the percentage of the corresponding year's statewide average salary figure after controlling for the differences in the level of teacher training and experience. This is a considerable amount of information to digest; however, a few patterns are noteworthy.[42]

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[40] Statewide Cost of Living Differences, 1989: Chapter 2. (LAC Report 89-01).

[41] Components of Teacher Salary Costs: A Cluster Analysis of Minnesota School Districts. Minnesota House of Representatives, Research Department: February, 1989.

[42] The findings in this Chapter are generally consistent with those of the Legislative Audit Commission, with the principal difference being that the present study analyzes the data across a period of time and groups districts by type or cluster. See: Minnesota Legislative Audit Commission, Statewide

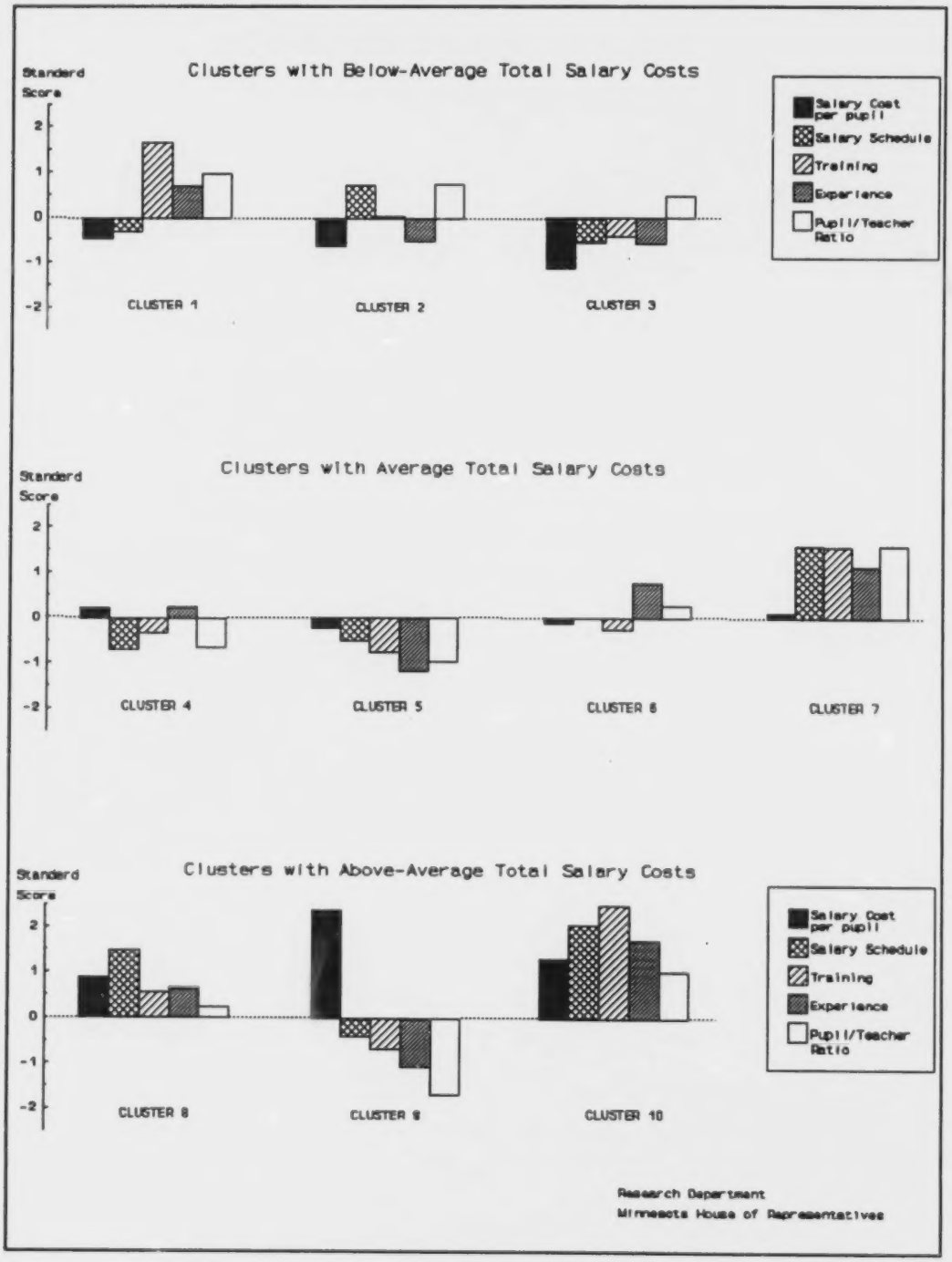
Table 4.1
Overview Of School District Clusters[43]

Cluster Name	Number of Districts	Examples	Additional Characteristics
Clusters With Below-Average Per-Pupil Salary Costs			
Cluster 1: Urban Nonmetro Districts With Growing Enrollment and Moderate Salary Schedules	19 Districts	St. Peter (508) Little Falls (482) Faribault (656)	Highly-trained and experienced teachers; high pupil/teacher ratio; low assessed valuation
Cluster 2: Urban Fringe Districts With Growing Enrollment	53 Districts	Rush City (139) Farmington (192)	Low teacher experience; high pupil/teacher ratio; high salary schedule; low assessed valuation
Cluster 3: Rural Districts With Above-Average Pupil/Teacher Ratio	48 Districts	Royalton (485) Holdingford (738)	Low teacher training and experience; low pay scale; high pupil/teacher ratio; stable enrollment
Clusters With Average Per-Pupil Salary Costs			
Cluster 4: Rural Districts With Declining Enrollment	96 Districts	Lake Crystal (70) Isle (473)	Low salary schedule; low pupil/teacher ratio
Cluster 5: Small, Rural Districts With Declining Enrollment	66 Districts	Clara City (126) Raymond (346)	Low pupil/teacher ratio; low teacher training and experience; low salary schedule
Cluster 6: Nonmetro Districts With Average Cluster Characteristics	63 Districts	Byron (531) Crookston (593)	High teacher experience
Cluster 7: Urban Nonmetro and Suburban-Metro Districts With High Salary Schedules	28 Districts	Anoka (11) Hibbing (701) International Falls (361)	High teacher training and experience; high pupil/teacher ratio
Clusters With Above-Average Per-Pupil Salary Costs			
Cluster 8: Large, Nonmetro Districts With High Salary Schedules	19 Districts	Grand Rapids (318) Wilmar (347)	High teacher training and experience; high proportion of districts receiving taconite aid; declining enrollment
Cluster 9: Very Small, Rural Districts With Declining Enrollment	23 Districts	Borup (522) Campbell-Tintah (852)	High assessed valuation; low pupil/teacher ratio; extensive interdistrict cooperation; high referendum levy
Cluster 10: Large Metro Districts With Declining Enrollment	17 Districts	Minneapolis (Sp.1) St. Paul 625)	High salary schedule; high teacher training and experience; high pupil/teacher ratio

Cost of Living Differences. 1989: Chapter 2. (LAC Report 89-01).

[43] The cluster analysis which produced this grouping of school districts is based on data from the 1986-87 school year; generally, such patterns change little from year to year. This analysis is reported in detail in Minnesota House of Representatives, Research Department, Components of Teacher Salary Costs: A Cluster Analysis of Minnesota School Districts. February, 1989.

Figure 4.1
Salary Cost Profiles For The 10 Clusters Of Districts



First, the average salary figures differ considerably among the clusters. For example, in 1988-89, the unadjusted averages range from a low of $24,407 for teachers in the 66 districts in Cluster 5, to a high of $36,100 for teachers in the 17 districts in Cluster 10. In general, the above-average salaries are found in two types of districts:

1) large metro districts with declining enrollment (Cluster 10); and

2) urban nonmetro and suburban-metro districts with high salary schedules (Cluster 7).

The lowest average salaries, on the other hand, are generally found among small, rural districts with declining enrollments (Clusters 3, 4, 5 and 9).[44]

Second, there appears to be considerable stability in the relative salary levels of the clusters from year to year. For example, the percentages in Part D of Table 4.2 reveal the greatest relative change for the 23 districts in Cluster 9. Their relative average salary figure increased from 86.3% of the statewide average in 1976-77 to 93.7% in 1982-83, before falling back to 90.7% in 1988-89. Though this degree of change is not great, the relative salary levels of the other clusters fluctuated far less than this.

Third, the differences in salary levels among the clusters of districts are considerably less when controlling for teacher training and experience. For example, in 1988-89 the average salary as a percent of the statewide mean ranges from 77.7% (Cluster 5) to 114.9% (Cluster 10), or by 37.2 points, before controlling for training and experience, while it ranges from 90.3% to 105.8%, or by 15.5 points, after controlling for it. Thus, more than half of the observed salary differences among the clusters of districts is due to differences in the level of training and experience. That is, the districts with the higher pay scales also tend to have teachers with higher levels of training and experience.

Fourth, there is not a close relationship between the level of teacher pay in a district and the district's level of salary costs and benefits on a per pupil basis. For example, as shown by the graph in Figure 4.1, the 23 districts comprising Cluster 9 have the highest average per pupil teacher salary and benefit costs, even though Table 4.2 reveals that they have nearly the lowest average teacher salary figure. The reason for this apparent inconsistency, of course, is their small size; these districts are mainly very small, rural districts with declining enrollments.

For purposes of this analysis, however, the most important finding is that there has been some movement toward convergence in the salary figures among the clusters of school districts. Table 4.2, Part D, which controls for differences in levels of teacher training and experience, reveals that the lowest and highest salaried clusters in both the beginning and ending years of the study were Clusters 5 and 10, respectively. Controlling for training and experience differences, their average teacher salary amounts as a percent of the statewide average salary narrowed from 86.0% and 107.5% respectively in 1976-77 to 90.3% and 105.8% respectively in 1988-89. Thus, the spread narrowed by about one-fourth: from a spread of 21.5 points in 1976-77 to a spread of 15.5 points in 1988-89.

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[44] Not all of the districts in these four clusters have declining enrollments, especially not those in Cluster 3.

Table 4.2
Salary Trends By School District Clusters

A. AVERAGE TEACHER SALARY (NOT ADJUSTED)

Cluster Number	Number of Districts[45]	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
1	19	$13,654	$15,216	$17,384	$22,348	$24,496	$28,043	$30,530
2	53	12,749	13,930	15,826	20,657	23,633	26,716	28,903
3	48	12,002	13,279	14,969	19,001	21,138	23,460	25,961
4	96	12,036	13,373	15,294	19,346	21,519	23,966	26,314
5	66	11,302	12,335	13,982	17,720	19,917	22,180	24,407
6	63	13,192	14,681	16,900	21,457	23,830	26,529	28,812
7	28	15,127	16,880	19,697	25,137	28,237	31,550	33,777
8	19	14,408	15,987	18,369	23,405	26,207	28,845	31,712
9	23	11,272	12,578	14,463	18,663	20,851	23,501	25,338
10	17	17,232	19,530	22,213	27,278	30,641	33,582	36,100
Statewide	432	14,511	16,117	18,374	23,251	26,058	29,065	31,421

B. AVERAGE SALARY AS A PERCENT OF THE STATEWIDE MEAN SALARY

Cluster Number	Number of Districts	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
1	19	94.1 %	94.4 %	94.6 %	96.1 %	94.0 %	96.5 %	97.2 %
2	53	87.9	86.4	86.1	88.8	90.7	91.9	92.0
3	48	82.7	82.4	81.5	81.7	81.1	80.7	82.6
4	96	82.9	83.0	83.2	83.2	82.6	82.5	83.7
5	66	77.9	76.5	76.1	76.2	76.4	76.3	77.7
6	63	90.9	91.1	92.0	92.3	91.4	91.3	91.7
7	28	104.2	104.7	107.2	108.1	108.4	108.5	107.5
8	19	99.3	99.2	100.0	100.7	100.6	99.2	100.9
9	23	77.7	78.0	78.7	80.3	80.0	80.9	80.6
10	17	118.8	121.2	120.9	117.3	117.6	115.5	114.9

[45] The cluster analysis used to create these groupings of school districts was performed using district-level aggregate data from the 1986-87 school year. Appropriate adjustments were made to appropriately group the data from earlier years in which a few more districts existed. For details, see: Minnesota House of Representatives, Research Department, Components of Teacher Salary Costs: A Cluster Analysis of Minnesota School Districts. February, 1989.

Table 4.2 Continued
Salary Trends By School District Clusters

C. TRAINING AND EXPERIENCE WEIGHTS

Cluster Number	Number of Districts	1976-77	1978-79	1980-81[46]	1982-83	1984-85	1986-87	1988-89
1	19	1.4589	1.4923		1.6016	1.6325	1.6454	1.6660
2	53	1.3719	1.3817		1.4521	1.4817	1.5068	1.5302
3	48	1.3577	1.3805		1.4166	1.4704	1.4615	1.4852
4	96	1.3757	1.4001		1.4631	1.5220	1.5167	1.5300
5	66	1.3455	1.3482		1.3566	1.3657	1.3852	1.4207
6	63	1.4479	1.4784		1.5589	1.5931	1.6025	1.6169
7	28	1.5008	1.5470		1.6748	1.7019	1.6999	1.7063
8	19	1.4751	1.5076		1.5786	1.6016	1.6230	1.6526
9	23	1.3367	1.3317		1.3787	1.4105	1.4318	1.4679
10	17	1.6416	1.7151		1.8045	1.8243	1.7990	1.7931
Statewide	432	1.4857	1.5245	1.5640	1.6087	1.6369	1.6396	1.6513

D. AVERAGE TEACHER SALARY AS A PERCENT OF STATEWIDE MEAN SALARY CONTROLLING FOR TEACHER TRAINING AND EXPERIENCE

Cluster Number	Number of Districts	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
1	19	95.8 %	96.4 %		96.5 %	94.3 %	96.1 %	96.3 %
2	53	95.1	95.4		98.4	100.2	100.0	99.3
3	48	90.5	91.0		92.8	90.3	90.6	91.9
4	96	89.6	90.3		91.5	88.8	89.1	90.4
5	66	86.0	86.5		90.4	91.6	90.3	90.3
6	63	93.3	93.9		95.2	94.0	93.4	93.6
7	28	103.2	103.2		103.8	104.2	104.7	104.0
8	19	100.0	100.3		102.6	102.8	100.3	100.8
9	23	86.3	89.3		93.7	92.9	92.6	90.7
10	17	107.5	107.7		104.6	105.5	105.3	105.8

[46] Training and experience adjustment factors could not be calculated for the 1980-81 school year, since salary step and lane information was not available for that year.

Salary Trends By Geographic Regions

In the prior section, each school district cluster represents a group of districts with similar salary-related characteristics irrespective of their locations throughout the state. The present section repeats that analysis while grouping districts by their regional locations using the nine Education Cooperative Service Unit (ECSU) regions (Figure 4.2).[47] The purpose of the present analysis is to determine whether regional salary differences are increasing, decreasing or holding constant.

The structure of Table 4.3 for the presentation of the regional salary data is identical to the structure of 4.2 for the presentation of the salary data by school district clusters. However, since the regions generally contain more than one type of school district, the regional salary differences are generally less pronounced than the salary differences by clusters.

Table 4.3, Part A presents the average teacher salary figures for each of the nine ECSU regions for the 12-year period beginning in 1976-77. The unadjusted averages vary widely; for example, in 1988-89 they range from a low of $26,922 for region 6 (Southwestern Minnesota) to a high of $34,389 for region 11 (Twin Cities metro area). The only region besides the metro area with an unadjusted average in excess of the statewide average salary figure is region 3 (northeastern Minnesota) with an average of $31,679. Of the remaining regions, region 10 (Southeastern Minnesota) with $30,361 comes closest to the statewide average salary figure. Part B of Table 4.3 expresses these unadjusted average salary figures as percentages of the statewide figure in the corresponding year.

As with the earlier analysis grouping by clusters, Part C of Table 4.3 reveals considerable regional differences in the level of teacher training and experience, with the lower-salaried districts also having lower levels of training and experience. Thus, Part D of Table 4.3 re-expresses each average salary figure in Part A as the percentage of the statewide average after statistically controlling for training and experience differences. The differences among these percentages are considerably less than those in Part B, indicating that about half of the variation in the unadjusted average regional salary figures is due to differences in training and experience, while the other half is due to differences in the salary schedules. The figures in Part D also reveal considerable stability in the regional differences throughout the 12-year study period. Of the minor changes over time, the most notable are a slight decrease in the relative standing for region 3 (Northeastern Minnesota), and slight increases in the relative standings of regions 1 and 7 (Northwestern Minnesota and the Northern metro fringe). The finding in the earlier analysis by clusters of some movement toward convergence in salary levels is less apparent in this analysis by regions.

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[47] The ECSU regions are a slightly higher-level grouping of Minnesota's economic development regions, such that ECSU region 1 contains economic development regions 1 and 2; ECSU region 6 contains regions 6E, 6W and 8; and ECSU region 7 contains regions 7E and 7W.

Figure 4.2
The ECSU Regions

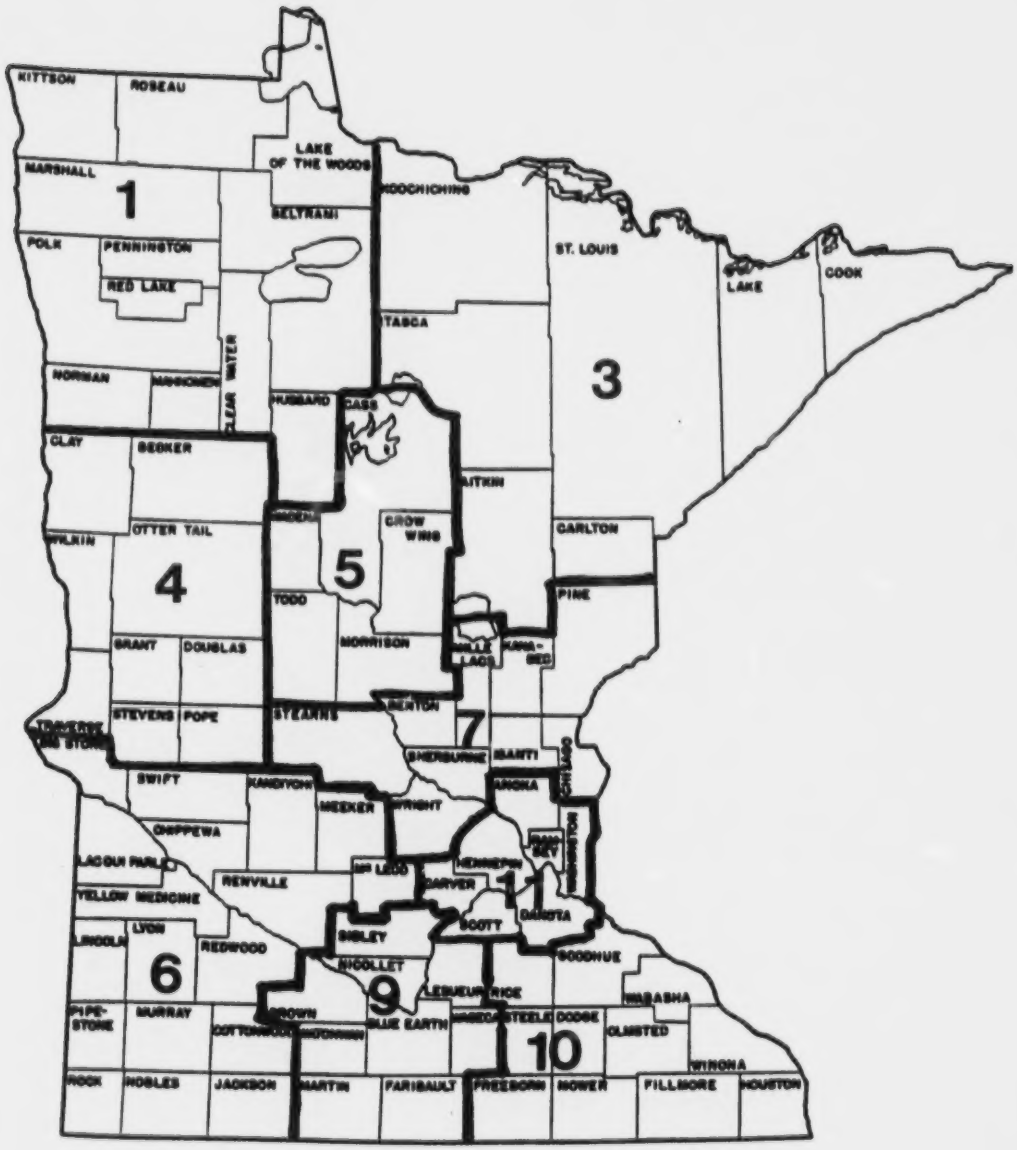

Table 4.3
Salary Trends By Geographic Regions

A. AVERAGE TEACHER SALARY (NOT ADJUSTED)

Region	Number of Districts	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
1	53	$12,290	$13,761	$15,800	$20,385	$22,388	$25,422	$27,494
3	35	15,029	16,860	19,297	24,221	26,569	29,239	31,679
4	41	13,202	14,460	16,593	20,918	23,298	26,002	28,245
5	26	12,839	14,193	16,082	20,421	22,768	25,547	28,136
6	88	12,625	13,827	15,759	20,038	22,323	24,706	26,922
7	42	12,910	14,236	16,276	21,265	24,031	27,001	29,388
9	45	13,142	14,440	16,491	20,894	23,349	25,943	28,080
10	54	13,917	15,516	17,875	22,614	24,871	27,767	30,361
11	48	15,925	17,776	20,257	25,468	28,815	32,057	34,389
Statewide	432	14,511	16,117	18,374	23,251	26,058	29,065	31,421

B. AVERAGE SALARY AS A PERCENT OF THE STATEWIDE MEAN SALARY

Region	Number of Districts	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
1	53	84.7 %	85.4 %	86.0 %	87.7 %	85.9 %	87.5 %	87.5 %
3	35	103.6	104.6	105.0	104.2	102.0	100.6	100.8
4	41	91.0	89.7	90.3	90.0	89.4	89.5	89.9
5	26	88.5	88.1	87.5	87.8	87.4	87.9	89.5
6	88	87.0	85.8	85.8	86.2	85.7	85.0	85.7
7	42	89.0	88.3	88.6	91.5	92.2	92.9	93.5
9	45	90.6	89.6	89.8	89.9	89.6	89.3	89.4
10	54	95.9	96.3	97.3	97.3	95.4	95.5	96.6
11	48	109.7	110.3	110.2	109.5	110.6	110.3	109.4

Table 4.3 Continued
Salary Trends By Geographic Regions

C. TRAINING AND EXPERIENCE WEIGHTS

Region	Number of Districts	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
1	53	1.3941	1.4161		1.4874	1.5252	1.5329	1.5495
3	35	1.5075	1.5489		1.6442	1.6597	1.6556	1.6745
4	41	1.4533	1.4716		1.5319	1.5533	1.5630	1.5857
5	26	1.4052	1.4226		1.4903	1.5294	1.5495	1.5698
6	88	1.4058	1.4264		1.4746	1.4986	1.5009	1.5239
7	42	1.3842	1.4083		1.4892	1.5282	1.5433	1.5678
9	45	1.4498	1.4803		1.5326	1.5587	1.5672	1.5815
10	54	1.4625	1.5034		1.5986	1.6405	1.6409	1.6499
11	48	1.5556	1.6021		1.6975	1.7227	1.7182	1.7203
Statewide	432	1.4857	1.5245	1.5640	1.6087	1.6369	1.6396	1.6513

D. AVERAGE TEACHER SALARY AS A PERCENT OF STATEWIDE MEAN SALARY CONTROLLING FOR TEACHER TRAINING AND EXPERIENCE

Region	Number of Districts	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
1	53	90.3 %	91.9 %		94.8 %	92.2 %	93.6 %	93.3 %
3	35	102.1	103.0		101.9	100.6	99.6	99.4
4	41	93.0	92.9		94.5	94.2	93.8	93.6
5	26	93.5	94.4		94.8	93.5	93.0	94.2
6	88	91.9	91.7		94.0	93.6	92.9	92.8
7	42	95.5	95.6		98.8	98.8	98.7	98.5
9	45	92.8	92.3		94.3	94.1	93.4	93.3
10	54	97.4	97.6		97.9	95.2	95.5	96.7
11	48	104.8	105.0		103.8	105.1	105.2	105.1

Chapter 5. National Trends In Teacher Salaries

Minnesotans have long taken pride in their public school system, and have demonstrated a willingness to spend more than residents of other states in order to support their schools. A 1990 Legislative Audit Commission report indicated that Minnesota has spent more on education per capita on average than has the United States as a whole, and has done so for at least the last sixteen years.[48] In recent years, however, it has been noted that the margin that Minnesota holds over the rest of the nation in this regard has narrowed as other states raised their educational expenditures in the mid-1980's.[49] Furthermore, an earlier Legislative Auditor report argued that Minnesota's "excellent national reputation for public education...is somewhat overstated and out of date".[50]

At the same time, however, there has been a rising concern in Minnesota over increasing school taxes, and particularly the increased use of referendum levies to boost school district revenues. Naturally, teacher salaries have come under increasing scrutiny in this environment, for teacher salaries are one of the largest components of school district expenditures.[51] This leads to the question: how have teacher salary trends in Minnesota compared to the nation as a whole? Is Minnesota an aberrant case in terms of teacher salaries, or has it largely followed national trends? This chapter addresses such questions.

Trends And Comparisons: Minnesota And The Nation

What is perhaps most striking about Minnesota's place among the states in rank of teacher salaries over the past twenty years is its consistency. For example, Minnesota has nearly always been at or above the national average for teacher salaries during this period. According to National Education Association (NEA) statistics presented in Table 5.1 and illustrated in Figure 5.1, only twice since 1970 -- in 1977-78 and in 1979-80 -- have Minnesota teachers had an average salary below the national average. In both cases, the average Minnesota salary had been only 1% below that year's national average.[52] Furthermore, Minnesota's average salaries have remained within a relatively limited range over this era. Minnesota's average salaries have ranged from 99.4% of the national average in 1977-78 to 111.0% in 1983-84.

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[48] School District Spending. February 1990: p 6. (LAC Report 90-03).

[49] Ibid., p. 6-7.

[50] High School Education. 1988: p. 153. (LAC Report 88-09).

[51] See School District Spending, p. 20-21.

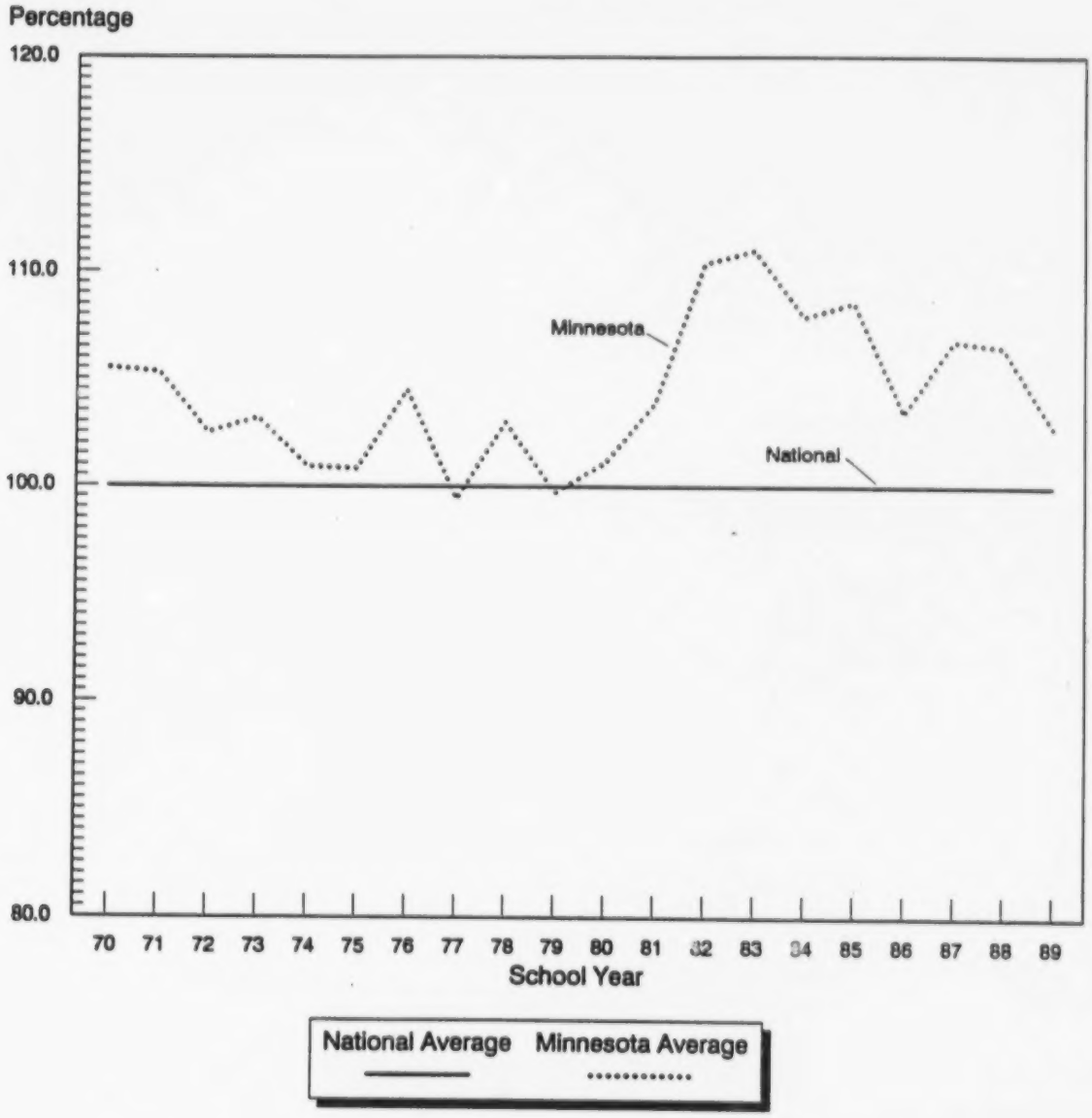
[52] National Education Association, Rankings of The States. Annual series.

Table 5.1
Minnesota's Average Teacher Salary As A
Percent Of The National Average Teacher Salary[53]

YEAR	PERCENTAGE
1970	105.5%
1971	105.3%
1972	102.5%
1973	103.2%
1974	100.9%
1975	100.8%
1976	104.5%
1977	99.4%
1978	103.0%
1979	99.7%
1980	101.1%
1981	103.9%
1982	110.4%
1983	111.0%
1984	107.9%
1985	108.6%
1986	103.4%
1987	106.8%
1988	106.5%
1989	102.8%

[53] Source: National Education Association, Rankings Of The States. Issued annually. The 1988 and 1989 figures are unrevised estimates.

Figure 5.1
Minnesota's Average Teacher Salary As A
Percent Of The National Average Teacher Salary



House Research Graphics

Minnesota's ranking among the states in average teacher salaries has been relatively consistent as well . According to NEA figures, Minnesota has ranked between 10th and 20th in every year from 1970 on except for two. These years were 1979-80 (when Minnesota ranked 21st) and 1985-86 (when Minnesota ranked 7th).[54] The general picture painted by these figures is that Minnesota has been a state in the last 20 years where teachers have generally been paid slightly better than their average counterparts nationwide, but not as well as in some states. However, it should be noted that it was not particularly unusual in the 1960's for Minnesota's average teacher salaries to be very slightly below the national average.[55]

Another aspect of Minnesota's place relative to the nation is that, as the Legislative Auditor's report suggests, Minnesota has indeed lost some ground relative to other states in the last few years. Minnesota has fallen from 7th place among the states and 108.6% of the national average in 1985-86 to 15th place and 103.5% in 1989-90.[56] While in one sense this is a significant decline, it should be noted that the current figures lie well within the pattern of the past 20 years.

A related matter of interest is how Minnesota compares to other Midwestern states. For purposes of this chapter, this includes all states which border on Minnesota (Wisconsin, Iowa, North Dakota and South Dakota) plus all other states that are members of the "Big Ten" collegiate conference (Illinois, Michigan, Indiana and Ohio.) Table 5.2 and Figure 5.2 offer such a comparison. Several comparisons can be noted from this table.

Teacher salaries in both of the Dakotas have lagged far behind Minnesota throughout this period. This is particularly true of South Dakota, which has had the lowest average teacher salary in the nation on several occasions in the last 10 years. NEA figures for the 1989-90 school year indicate that the average teacher salary in South Dakota was over $10,000 lower than the average Minnesota salary.[57]

Indiana, Iowa and Ohio, while higher in salary than the Dakotas, have also consistently lagged behind Minnesota. Ohio and Iowa seem to be moving in opposite directions, however; Iowa's rank has been falling over the past several years, while Ohio's has been rising. Ohio's 1989-90 average salary was only $1200 short of Minnesota's figure.[58]

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[54] Ibid.

[55] See: National Education Association, Rankings of the States, annual series. For a year-by-year listing of these rankings, see Table 5.2.

[56] Ibid. In 1983-84, Minnesota's average salary was even higher as a percentage of the national average (111.0%), though its rank (11th) was actually lower.

[57] NEA figures published in Education Week, May 9, 1990. The actual difference was closer to $11,000 ($10,890).

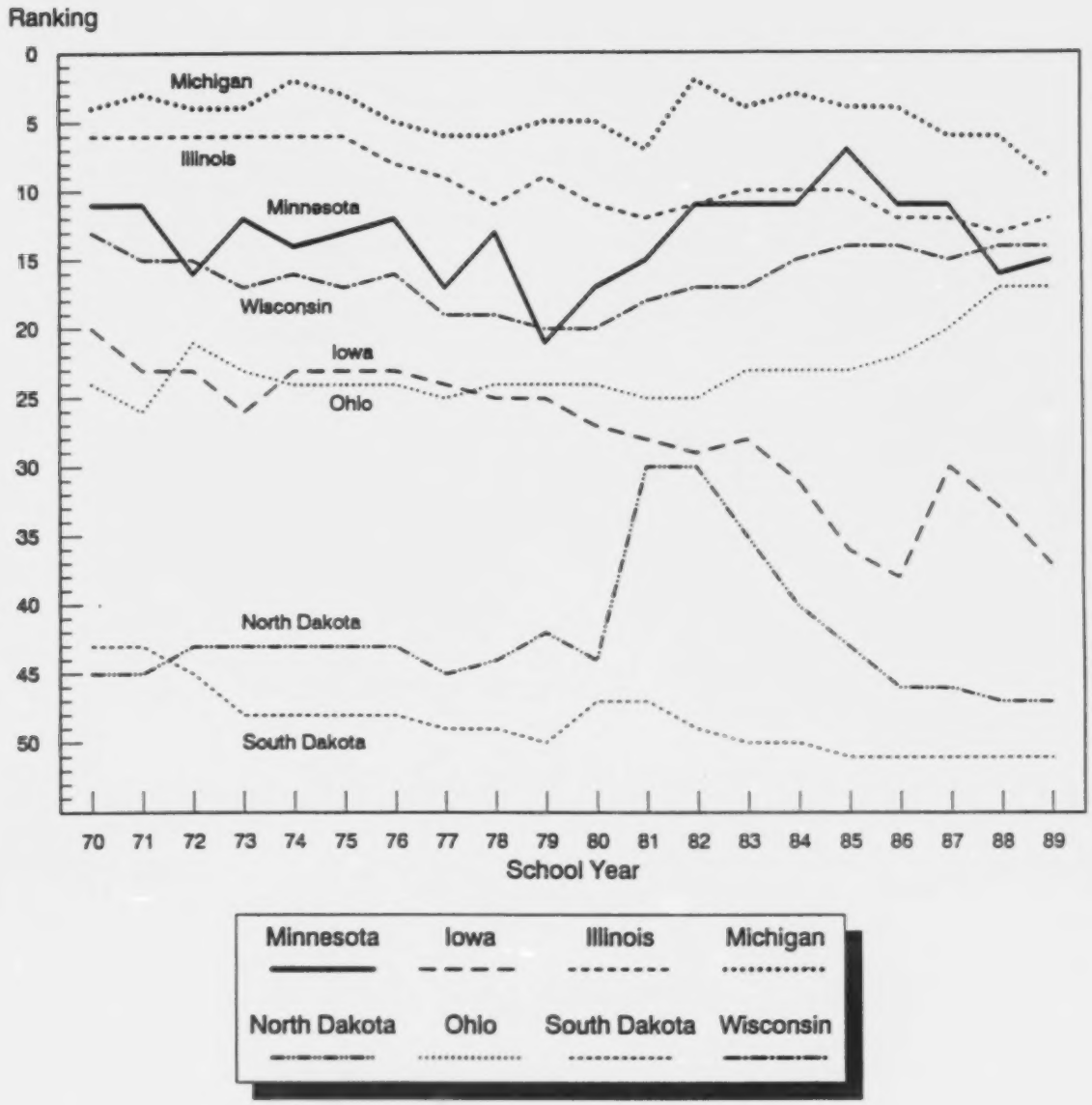
[58] Ibid.

Table 5.2
National Rankings Of Average Teacher Salaries
For Selected Midwestern States: 1970-1989[39]

	STATE AND RANKING								
	Minn	Iowa	Ill.	Ind.	Mich	N.D.	Ohio	S.D.	Wis.
1970	11	20	6	16	4	45	24	43	13
1971	11	23	6	19	3	45	26	43	15
1972	16	23	6	19	4	43	21	45	15
1973	12	26	6	18	4	43	23	48	17
1974	14	23	6	19	2	43	24	48	16
1975	13	23	6	20	3	43	24	48	17
1976	12	23	8	22	5	43	24	48	16
1977	17	24	9	23	6	45	25	49	19
1978	13	25	11	23	6	44	24	49	19
1979	21	25	9	23	5	42	24	50	20
1980	17	27	11	22	5	44	24	47	20
1981	15	28	12	24	7	30	25	47	18
1982	11	29	11	24	2	30	25	49	17
1983	11	28	10	22	4	35	23	50	17
1984	11	31	10	24	3	40	23	50	15
1985	7	36	10	25	4	43	23	51	14
1986	11	38	12	24	4	46	22	51	14
1987	11	30	12	25	6	46	20	51	15
1988	16	33	13	20	6	47	17	51	14
1989	15	37	12	22	9	47	17	51	14

[39] Source: National Education Association, Rankings Of The States. Issued annually; and Education Week, May 9, 1990. The 1988 and 1989 figures are unrevised estimates. The selected states include the following: Minnesota, all states bordering on Minnesota, and all other states currently members of the Big Ten Athletic Conference. Rankings include the 50 states plus the District of Columbia.

Figure 5.2
National Rankings Of Average Teacher Salaries
For Selected Midwestern States: 1970-1989



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Minnesota has nearly always been ahead of Wisconsin's average salary during the past 20 years, though the margin has usually been slight. For the first time since 1979, however, Wisconsin's average salary for 1989-90 has surpassed that of Minnesota, though only by a slender margin of $130.[60]

Minnesota lagged behind Illinois salaries throughout the 1970's, but as Illinois' relative position began to fall in the late 1970's, Minnesota's salaries have become relatively competitive with Illinois (though Minnesota has fallen back somewhat in the last three years). **Minnesota teachers, however, have been behind Illinois teachers in nearly all of the past twenty years.**[61]

The only one of these Midwestern states which has had a higher average teacher salary than Minnesota in each of the past twenty years has been Michigan. Michigan's teacher salaries are relatively high; Michigan's salaries have been in the top 10 nationally in every year since at least 1970. In no year during that period has any of these Midwestern states -- including Minnesota -- equalled Michigan's average salary.[62] This is quite remarkable, particularly when one considers that Michigan has faced significant economic problems in the past twenty years. For 1989-90, Michigan teachers made on average nearly $4,000 more than Minnesota teachers.[63]

In summary, over the last 20 years, Minnesota teachers have been paid more than their counterparts in most other Midwestern states. Only Michigan teachers have always been paid more throughout this period, though Illinois teachers have usually been paid more as well. Moreover, if Minnesota is lumped in with other states sometimes described as "midwestern" -- Nebraska, Kansas, Oklahoma and Missouri -- the picture does not change significantly. Minnesota's teacher salaries over the past 20 years have consistently been ahead of all four of these states, as well.[64]

The other notable comparison between Minnesota teacher salaries and salaries paid in other states is that nearly all states paying higher average salaries than Minnesota in recent years are states on the East and West coasts -- especially in the Northeast -- where the cost of living tends to be higher than in Minnesota. In 1989-90, for example, the only states ahead of Minnesota in average teacher salary that did not fit in the coastal category were Michigan, Illinois and Wisconsin, even though Minnesota only ranked 15th among the states (see Table 5.3).[65] In the most recent American Federation of Teachers (AFT) salary report, when average salaries for 1989-90 were adjusted by taking into consideration the

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[60] Ibid.

[61] Ibid.

[62] Ibid.

[63] From NEA figures published in the May 9, 1990 edition of Education Week. The actual difference between Michigan and Minnesota for 1989-90 is $3820.

[64] National Education Association, Rankings of the States. Annual series.

[65] NEA figures published in Education Week, May 9, 1990.

Table 5.3
Statewide Average Teacher Salary Rankings: 1989-90[66]

State	Unadjusted	Adjusted For Cost-Of-Living	State	Unadjusted	Adjusted For Cost-Of-Living
Alabama	39	34	Missouri	33	29
Alaska	1	8	Montana	41	39
Arizona	24	33	Nebraska	42	36
Arkansas	50	49	Nevada	20	15
California	3	2	New Hampshire	25	40
Colorado	19	19	New Jersey	8	38
Connecticut	2	16	New Mexico	40	41
Delaware	11	18	New York	4	7
D.C.	5	21	North Carolina	31	23
Florida	28	27	North Dakota	47	47
Georgia	30	22	Ohio	17	13
Hawaii	16	50	Oklahoma	46	43
Idaho	45	46	Oregon	21	10
Illinois	12	5	Pennsylvania	13	14
Indiana	22	6	Rhode Island	7	11
Iowa	37	32	South Carolina	34	30
Kansas	27	28	South Dakota	51	51
Kentucky	38	31	Tennessee	35	26
Louisiana	48	44	Texas	32	25
Maine	36	35	Utah	44	45
Maryland	6	9	Vermont	26	24
Massachusetts	10	42	Virginia	18	12
Michigan	9	1	Washington	23	20
MINNESOTA	**15**	**4**	West Virginia	49	48
Mississippi	43	37	Wisconsin	14	3
			Wyoming	29	17

[66] Sources: National Education Association figures published in Education Week, 5/9/90 (unadjusted); and F. Howard Nelson, Survey and Analysis of Salary Trends, American Federation of Teachers, Washington D.C., July, 1990 (adjusted).

different cost of living in different states, Minnesota teachers came out as the 4th highest paid on average out of the 50 states and the District of Columbia in the country, trailing only Michigan, California and Wisconsin (Table 5.3). The ranking of many of the states that would have led Minnesota if cost of living was left uncontrolled, such as Connecticut, New York, Pennsylvania, and Delaware, fell behind Minnesota in the adjusted measure.[67]

American Teachers As A Whole: 1970-1990

Aside from comparing states to one another, how have American teacher salaries fared over the past twenty years? A number of general patterns can be noted.

The basic facts concerning teacher salaries in the United States as a whole are somewhat more straightforward than their explanations. Controlling for inflation, teacher salaries made significant real dollar advances during the late 1960's. This pattern continued through 1972. In fact, 1972 was the all-time high water mark nationally for inflation-adjusted teacher salaries until relatively recently. During the rest of the 1970's, purchasing power of workers as a whole was significantly curtailed in the face of high inflation, and teachers were no exception to this trend. As a matter of fact, teacher salaries only gained ground on inflation in one year (1976) between 1973 and 1981. This trend experienced a dramatic turnaround in the 1980's, however. After 1981 (the year in which the trend of lower real salaries bottomed out), teacher salaries in constant dollars have increased every year to the present. As teacher salaries have gained on inflation, they have also gradually made up the ground that they lost to inflation during the 1970's. By 1987, national average teacher salaries (in inflation-controlled dollars) had rebounded to a level slightly greater than 1972. These gains have continued (although their pace has slowed slightly) to the present. As a result, average teacher salaries in real dollars are now at their highest levels ever.[68]

Minnesota's teacher salaries appear to have followed a largely similar pattern. Some differences, however, can be noted. As opposed to teachers nationwide, whose real salaries hit a peak level in 1972, Minnesota teachers peaked sooner. Minnesota teacher salaries in constant dollars topped out in 1970, following significant gains in the late 1960's, and then began to decline. The decline that hit teachers nationally in the mid-to-late 1970's appears to have hit Minnesota teachers even harder. As noted earlier in this chapter, this included the only years since the start of the 1970's in which Minnesota teacher salaries actually dipped below the national average. Since these were years in which teachers nationwide were doing poorly against inflation, it is quite clear that these were very lean years indeed for Minnesota teachers. A dramatic turnaround followed in the first half of the 1980's at a rate ahead of the national average; Minnesota peaked relative to the nation in 1985, and has been outgained relative to the rest of the country since about 1985.[69]

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[67] F. Howard Nelson, Survey and Analysis of Salary Trends 1990. Washington: American Federation of Teachers, Research Department, 1989: p. 16.

[68] All figures in this paragraph come from Nelson, Ibid, p.28, 29 and 33.

[69] National Education Association, Rankings of the States, and Estimates of School Statistics, both annual series; and NEA statistics published in Education Week, May 9, 1990.

What produced these patterns of teacher salaries in Minnesota and the nation as a whole? Three factors appear to have been crucial: the condition of the economy, demographic patterns, and governmental actions.

Economic Factors

As suggested earlier, the mid-to-late 1960's and the early 1970's were a time of relatively high prosperity and economic growth, coupled with relatively low inflation. Teacher salaries reflected this healthy state, both in Minnesota and in the nation as a whole. Minnesota teacher salaries leaped forward substantially in the closing years of the 1960's, and both Minnesota teachers and teachers nationwide reached new highs in purchasing power during the early 1970's. The energy crisis and the high rates of inflation that followed not only brought these gains to a screeching halt, but led to a situation in which teachers actually lost purchasing power through the rest of the decade. And as if the high rates of inflation weren't bad enough, the nation also experienced a period of economic stagnation and slow growth. Economists had to coin a new term for this combination of stagnant growth and high inflation: stagflation. The combination of these economic threats made it difficult for teachers to maintain their economic gains, as financially strapped school districts were experiencing relatively low revenue growth at the same time that inflation was diminishing the value of the dollar. It is hardly surprising that it was difficult for teachers to maintain their purchasing power during this period.

The economic picture brightened somewhat by the mid-1980's. The mid-to-late 1980's saw extended periods of sustained economic growth and relatively low rates of inflation. This healthier economic environment made it possible for teachers to make up the ground that they lost in the mid-to-late 1970's and the very early 1980's. It should be recalled, however, that the early 1980's were not a period of particularly rapid economic growth, and unemployment was very high indeed through 1982. Minnesota's economic picture was relatively similar. And yet, teachers not only saw their real incomes rise, but they saw them rise at a rate even faster than the workforce as a whole through most of the 1980's. (They also saw their real incomes **decrease** at a rate even faster than the workforce as a whole during much of the 1970's).

Demographic Factors

Another key set of factors affecting teacher salaries had their roots in American demographic patterns. The most important demographic factors affecting teacher salaries are those connected to the number of children present in society. This is the case because as the number of school age children changes, the demand for teachers changes as well.

This is exactly the sort of change that so dramatically affected American society after the close of the Second World War. In the postwar era, as servicemen and women returned to their homes, and the American economy experienced a substantial degree of prosperity, many couples decided to have children, which resulted in the well-known "Baby Boom". One of the most direct byproducts of the Baby Boom was a dramatic increase in the demand for teachers, school space, and other educational resources as school enrollment swelled. This

increased demand for teachers may have helped to raise teacher salaries in the 1960's and early 1970's; certainly, overall school spending rose substantially.

As the 1970's rolled along, however, the Boomers were leaving school in increasing numbers, as they graduated. Since there weren't as many children born in the more recent years, school enrollment began to decline significantly in the mid-1970's, both in Minnesota and nationally, as can be seen from Table 5.4. Figure 5.3 further reveals the depth of the enrollment decline in Minnesota as compared to the nation. Naturally, this meant that there was also less demand for teachers. As a result, school districts began to significantly reduce their teacher force through layoffs, resignations and non-replacement of retirees in the late 1970's in order to cut costs.

The number of students declined so quickly during this period of time that the number of pupils per teacher experienced a substantial decline, even as many teachers were being laid off nationwide. This was true both of Minnesota schools and of schools nationally.[70] Some of this change, however, may also be attributed to increased special education enrollment (which typically has a relatively low number of pupils per student) or to an ideological commitment by school districts to lower class sizes, in the hope that this would improve education. Gary Farland's chapter in the 1989 Economic Report to the Governor notes both that "the increase in special education services has worked to bring the [pupil-teacher ratio] down" (p.62) and that "Minnesota has about 25% more special education teachers per student than the national average" (p.67). It should also be noted that it does not appear implausible that the low demand for teachers may have had an effect of lowering their salaries, prior to the coming of large-scale layoffs in the late 1970's and early 1980's.

In addition to the obvious effect that this had on school district budgets, it also had a curious effect upon average teacher salaries. The teachers who were laid off tended to be those with the least amount of seniority, as is usually the case with layoffs. Naturally, these teachers also tended to be those who were toward the bottom of their salary schedules. As a result, average salaries actually went up at the same time school districts were carrying out reductions in force, because the teacher who still had jobs were disproportionately those who had a relatively great deal of experience. In other words, school districts found themselves with fewer teachers, but ones who were also better paid on average. [71] Again, this trend of a more experienced (though smaller) teacher force applied to both Minnesota and to the nation as a whole. This marked the beginning of the upward swing in average teacher salaries in real dollars that has continued to the present day.

Teachers' unions such as the American Federation of Teachers have been quick to point out the effect that this higher level of experience of teachers has upon their salary averages. They note the substantially greater amount of experience teachers have today, as compared

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[70] National Education Association, Rankings of the States. Annual series.

[71] A somewhat similar paradox produced by these changes was that per-pupil costs were presumably rising (due to smaller pupil-teacher ratios), but overall costs for districts were also presumably declining (since there were fewer students to take care of, and with them, fewer teachers and other personnel on the payroll).

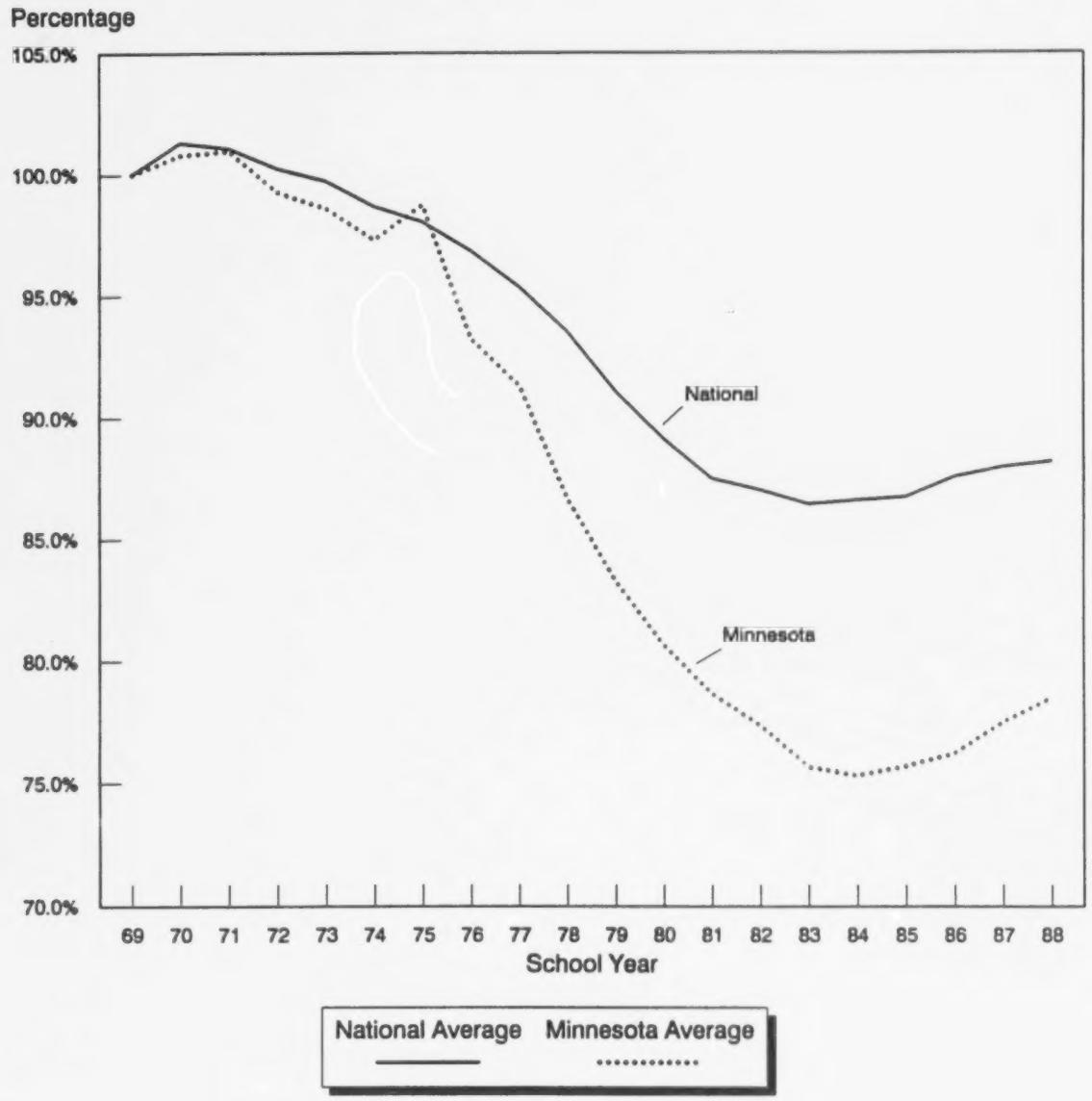
Table 5.4
Selected Public School Enrollment Figures
Minnesota And The Nation: 1969-1988[72]

	UNITED STATES		MINNESOTA	
YEAR	AVG. DAYS ATTENDED	AVG. DAILY MEMBERSHIP	AVG. DAYS ATTENDED	AVG. DAILY MEMBERSHIP
1969	42,167,539	45,041,516	874,000	918,500
1970	42,723,202*	45,573,161	881,000	930,000
1971	42,626,558	45,663,748*	882,478*	931,562*
1972	42,277,382	45,237,282	867,508	912,411
1973	42,058,975	44,972,672	861,700	906,000
1974	41,608,781	44,549,649	850,600	912,500
1975	41,344,178	44,378,338	862,853	910,182
1976	40,840,580	43,634,577	814,923	857,814
1977	40,223,837	42,886,031	797,996	841,991
1978	39,441,567	42,049,420	757,191	800,413
1979	38,418,704	41,101,222	727,750	774,200
1980	37,605,575	40,188,761	705,069	750,073
1981	36,907,634	39,452,036	687,562	729,896
1982	36,708,576	38,904,716	676,220	714,820
1983	36,467,180	38,584,700	661,463	699,465
1984	36,528,840	38,853,801	658,404	695,694
1985	36,582,990	n/a	661,633	699,231
1986	36,933,373	n/a	666,409	703,705
1987	37,102,227	n/a	677,526	713,185
1988	37,200,388	n/a	686,312	723,287

* Peak year for this data series.

[72] Source: National Education Association, Rankings of The States. Annual series.

Figure 5.3
Percentage Change In Enrollments
Using Average Days Of School Attended
Minnesota And The Nation: 1969-1988



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to the early 1970's when substantial numbers of relatively inexperienced teachers were on the payroll, and argue that if one controls for experience, teachers have still not caught up to their peak level, which occurred in 1972. For example, they would argue that this means that a teacher with a given amount of experience -- say, 10 years -- actually is worse off than a teacher with the same level of experience in 1972.[73]

The decline in school enrollment that created this situation for school staffing has begun to turn around in recent years, as school enrollment has stabilized and even has started to rise again. This has been attributed to a "Baby Boomlet" that has now entered the school age population. This rebound in school enrollment can also be seen in Table 5.4 and Figure 5.3. This "boomlet" has been produced by the previous "baby boomers" entering childbearing years and having children of their own. The boomlet has largely affected elementary enrollment to date, but will have an effect on secondary schools in a few years. This demographic change led to a great deal of fear by many in the education field during the mid-1980's that the supply of teachers would be inadequate to meet growing school enrollments. Some have argued that schools during this period dealt with these problems by the use of questionable and undesirable staffing practices, such as misassigning teachers into areas of teaching in which they were not sufficiently skilled, inappropriate use of emergency certificates, and so forth.[74] Many observers were particularly fearful that qualified teachers in areas of relative shortage (such as mathematics and science) would be especially difficult to recruit. Such fears were commonly expressed in the education literature in the early-to-mid 1980's.[75] This widespread fear of a teacher shortage may have influenced state legislatures to take action to boost teacher salaries in their states, as will be discussed later in this chapter.

A somewhat different demographic factor affecting teacher salaries which has received a great deal of attention in the education literature concerns two particular groups in society from which teachers have traditionally been drawn: women and people of color. It has been argued that since many other occupations were closed to these groups in the past, the teaching profession -- which was relatively open to hiring women and other minorities -- was able to hire them at relatively low salaries due to their limited occupational alternatives. As opportunities in the workplace have become more plentiful, the argument goes, schools have been forced to raise the salaries that they pay their teachers, because there is now

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[73] F. Howard Nelson, Survey and Analysis of Salary Trends 1989. Washington: American Federation of Teachers, Research Department, 1989: p. 22.

[74] For examples of this view, see Robert Roth, "Emergency Certificates, Misassignment of Teachers, and Other 'Dirty Little Secrets'", Phi Delta Kappan, June 1986; and Gary Watts, "And Let the Air Out of the Volleyballs", Phi Delta Kappan, June 1986. For a counter argument, see C. Emily Feistritzer, Teacher Crisis: Myth or Reality?. Washington: National Center For Education Information, 1986.

[75] Good examples include James Guthrie and Ami Zusman, Mathematics and Science Teacher Shortages: What Can California Do?. Berkeley: Institute of Governmental Studies, University of California, Berkeley, 1982; and Willis Hawley, "Toward A Comprehensive Strategy for Addressing the Teacher Shortage", Phi Delta Kappan, June, 1986. Furthermore, certain fields within science were seen as having particularly severe shortages, especially chemistry and physics (but not biology). See Henry Levin, "Solving the Shortage of Mathematics and Science Teachers", Educational Evaluation and Policy Analysis, Volume 7, Number 4, 1985.

much more competition for these people. In other words, now that the captive source of teacher supply is no longer captive, salaries have increased as a direct consequence.[76]

There is some reason to question how well this theory applies to Minnesota. First, Minnesota has never had a particularly large teacher force of people of color, partly because racial minorities are not nearly as numerous in Minnesota as in other states. Secondly, Minnesota has not been a state that has traditionally relied as much on women to staff its teacher force as many other states have. This is especially true when comparing Minnesota to states in the South, which have a much larger proportion of women teachers. In at least the last twenty years, Minnesota has always ranked very high in its percentage of male teachers. In fact, during the past twenty years, Minnesota has never been out of the top ten of the 50 states and the District of Columbia in its proportion of male teachers, and has only rarely been out of the top five. In addition, the percentage of Minnesota teachers who are women has not declined significantly in Minnesota in recent years, as would be expected if women were being lured away from teaching for more lucrative fields newly opened to them.[77] This strongly suggests that Minnesota has not been as dependent upon women and minorities to staff their teaching positions as have some other states. As a result, it would appear that explanations of teacher salary increases relying upon expanded employment opportunities for women and people of color will not be as important in Minnesota as it may be elsewhere.[78]

Governmental Factors

The third of the three groups of key factors affecting teacher salaries is governmental action on educational issues. Chronologically, this was the last of the three factors to play a major salary role in recent years. This is because there was relatively little action taken by state governments (or anyone else) that had a lasting impact upon teacher salaries during the 1970's and the very early 1980's.[79] Instead, efforts during this period to produce changes

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[76] In one form or another, this argument can be found, among other places, in Guthrie and Zusman, 1982; James Fox, "Restructuring the Teacher Work Force to Attract the Best and The Brightest", Journal of Education Finance, Volume 10, Fall 1984; Willis Hawley, "Toward A Comprehensive Strategy for Addressing the Teacher Shortage", Phi Delta Kappan, June 1986; and Richard Salmon, "Teacher Salaries: Progress Over The Decade", in Kern Alexander and David Monk (eds.), Attracting and Compensating America's Teachers: Eighth Annual Yearbook of the American Education Finance Association. Cambridge, Massachusetts: Ballinger Publishing, 1987.

[77] National Education Association, Rankings of the States. Annual series.

[78] There has been some question whether the idea that expanded vocational opportunities for women have raised teacher salaries is even applicable nationally. For a harshly critical view of this "expanded opportunities" thesis, see C. Emily Feistritzer, Teacher Crisis: Myth or Reality?. Washington, D. C.: National Center For Education Information, 1986.

[79] The main exception to this statement would be the presence of increased mandates for special education and the like, which may have produced increased spending on salaries due to the increased number of positions. However, this was not directly a part of any explicit strategy to raise teacher salaries for the sake of raising teacher salaries.

in the educational system were more commonly directed toward equity issues, such as efforts to foster greater interdistrict equity in school finance systems.[80]

A dramatic change occurred in the early 1980's regarding the role played by government in education. In contrast to the emphasis upon equity seen in the 1970's, the 1980's -- led by the Reagan Administration -- saw a greater emphasis upon educational "excellence".[81] As will be seen, the excellence movement had a profound impact upon teacher salaries across the nation.

While there had been some earlier calls for a shift in emphasis toward excellence in school performance, this educational movement was largely set in motion by a prominent report with an ominous title, A Nation at Risk: The Imperative for Education Reform, published in 1983.[82] The seminal role of A Nation at Risk has been frequently noted in education literature. Deborah Verstegen and Patricia Anthony, for example, argue that:

> A Nation at Risk set the future parameters of debate and the tenor of what would follow, affecting the scale and character of education improvement across the United States, and giving birth or renewed life to the hundreds of other task forces and commissions, cast in its form, and guided by its substance.[83]

This report was a ringing indictment of the American educational system, and even went so far as to say:

> If an unfriendly foreign power had attempted to impose on America the mediocre educational performance we have today, we might well have viewed it as an act of

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[80] For contrasts between the 1970's and the 1980's in this regard, see, for example, Craig Richards, "Minimum Teacher Salary Legislation in New Jersey: Cui Bono?", Journal of Education Finance, Fall, 1986; James Gordon Ward and William Camp, "An Analytical View of Two Decades of Reform in School Finance", Journal of Education Finance, Volume 14, Summer, 1988; and William Lowe Boyd, "How To Reform Schools Without Half Trying: Secrets of The Reagan Administration", Educational Administration Quarterly, Volume 24, Number 3, August, 1988.

[81] Ibid.

[82] National Commission on Excellence in Education, A Nation At Risk: The Imperative For Educational Reform, Washington: U.S. Government Printing Office, 1983. Among the many additional writings in which A Nation At Risk is given credit as a crucial turning point in education reform include Denis Doyle and Terry Hartle, Excellence in Education: The States Take Charge. Washington, D. C.: American Enterprise Institute, 1985. Benjamin Stickney and Laurence Marcus, The Great Education Debate: Washington and The Schools, Springfield, Illinois: Charles C. Thomas Publishing, 1984; and George Kaplan, "New Beginnings, New Limits: Education and the 1988 Presidential Election", Phi Delta Kappan, Volume 70, Number 2, October, 1988.

[83] Verstegen and Anthony, "Is There a Federal Role in Education Reform?", Journal of Education Finance, Volume 14, Summer 1988, p.42-43.

> war. . . . We have, in effect, been committing an act of unthinking, unilateral educational disarmament. . . .[84]

The report highlighted a series of educational woes in the United States, such as declining performance on standardized tests, undesirably high dropout rates, and deficiencies in test performance and school curricula relative to other Western capitalist nations.

This comparison between the United States and other capitalist nations -- a comparison in which the United States did not fare well -- may well have been a crucial reason for the impact of A Nation at Risk. At the time in which it was released (1983), the United States was -- as it still is today -- seriously concerned with issues of competitiveness in the world marketplace. A Nation at Risk was very clear in expressing its opinion that deficiencies in the American educational system relative to our economic competitors were a key reason why the United States was falling behind in this area, and it provided extensive comparisons between the U.S. and other nations to bolster its arguments. The implication from A Nation at Risk, then, was that for America to compete effectively in the world marketplace, its educational system would need to be overhauled.

A Nation at Risk, then, was a most timely report. Not only did it forcefully chronicle American educational problems, but it offered a plan of action to help deal with another crucial and highly salient problem -- the problem of American economic competitiveness. As a result, the seeds sown by this report fell on fertile ground, and helped to create an educational reform movement known today as "first wave reform".[85] These additional first wave reports shared a good deal in common with A Nation at Risk, including its emphasis on more centralized control of school curricula, teacher competency testing, additional coursework and homework, fewer electives and more emphasis upon student proficiency in what A Nation at Risk called "the new basics". But one of the most common and important themes of these efforts -- including A Nation at Risk -- was that teacher salaries were generally too low to attract and retain competent personnel in the profession; therefore, it argued that salaries needed to be raised. While this was generally also coupled with other teacher salary reforms, such as merit pay and career ladder programs, there was also sentiment that teacher salaries needed general raises as well.

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[84] National Commission on Excellence in Education, A Nation At Risk: The Imperative For Educational Reform, Washington: U.S. Government Printing Office, 1983, p. 5.

[85] Good examples of these first wave reports include the U. S. Department of Education's The Nation Responds: Recent Efforts to Improve Education. Washington D.C.: 1984; and William Bennett, American Education: Making It Work, A Report to the President and the American People. Washington, D.C.: U. S. Department of Education, 1988. A good example of discussion of first-wave style reform in the Dallas schools prior to the national trend in this direction-and of first-wave style recommendations for action elsewhere- in Linus Wright and Deborah Inman, "The Impact of Educational Reform on Local School Districts", Journal of Education Finance, Volume 14, Summer 1988.

Across the country, many state governments took the first wave reform ideas to heart.[86] Many passed into law curriculum reforms of the type suggested by the first wave reports.[87] More importantly, many states directly allocated money to raise teacher salaries, or mandated such increases by local districts in an effort to attract students of higher calibre into teaching, and later in an effort to stem feared shortages of teachers. Other financial incentives were tried in an effort to attract more and better students into teaching. These included forgivable student loans to college students who would enter teaching and similar incentives to attract potential teachers into shortage areas, such as mathematics and science.

It should be noted that many of the efforts of states to raise teacher salaries were intended primarily for beginning teachers, such as the programs to encourage college students to go into teaching as a profession and the establishment of higher minimum statewide teacher salaries. Such efforts were particularly common in Southern states where teacher salaries had been relatively low for many years; Virginia and Georgia are two examples of such states which saw dramatic increases in teacher salaries during this period. However, other states outside the South whose salaries were already near or above the national average took significant actions to raise teacher salaries. New Jersey and Connecticut are prominent examples of such states. Connecticut, for example, raised its minimum teacher salary by over 25% between 1985-86 and 1986-87.[88]

As states took these actions, the economic motivation to improve education as suggested by A Nation at Risk and other articles and reports was clearly in evidence. As a prominent report by the National Governors' Association, Time For Results, put the matter, "What has gotten the governors' attention [concerning education issues]? Jobs. More than anything, it is the threat to the jobs of the people that elect us".[89]

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[86] It should be noted that while the federal government may have provided the impetus for education reform in the 1980's, most of the actual action was done at the state and local levels, including paying the expense.

[87] A good general discussion of the actions taken by states in the immediate post Nation at Risk period can be found in: Denis Doyle and Terry Hartle, Excellence in Education: The States Take Charge. Washington: American Enterprise Institute, 1985. Also of special interest is: U.S. Department of Education, The Nation Responds: Recent Efforts to Improve Education. Washington D.C.: U.S. Government Printing Office, May, 1984. This report was released one year after Nation at Risk and discusses what each state had since done in the area of education reform. Also, see: Chris Pipho, "Kappan Special Report: States Move Reform Closer To Reality", Phi Delta Kappan, June, 1986.

[88] William Sparkman and Billy Walker, "Education Reform and Changing Compensation Practices", Journal of Education Finance, Volume 14, Summer 1988, p. 85. For a discussion of New Jersey's legislation boosting minimum teacher salaries, see Craig Richards, "Minimum Teacher Salary Legislation in New Jersey: Cui Bono?", Journal of Education Finance, Volume 12, Fall, 1986.

[89] National Governors' Association, Time For Results: The Governors' 1991 Report on Education. Washington, D.C.: National Governors' Association, 1986. It should also be noted that efforts to reform schools do continue today. For a brief but informative view of the dramatic school reforms currently underway in Kentucky, see Tim Storey, "Kentucky Redesigns Its Schools", State Legislatures, Volume 16, Number 6, July, 1990. Storey describes Kentucky's reforms as "the most comprehensive recent effort by any state to restructure its system of education" (p. 47).

Other observers noted the emphasis upon jobs in explaining these actions, as well. For example, William Lowe Boyd observed that "schooling, for the first time, became a hot and profitable political issue, one linked to the creation of jobs" and that it was particularly southern governors that picked up on the agenda of A Nation at Risk; governors "saw the connection between improved schooling and improving a state's economy".[90] And, as Doyle and Hartle argue:

> The report of the National Excellence Commission [which wrote A Nation at Risk] ... was written at a propitious time. The nation's interest in reversing the sluggish economic growth of the 1970's created a climate that eagerly accepted the commission's strong indictment of the schools.[91]

An alternative view of the policy process suggests other reasons for legislative action to raise teacher salaries. This view points out that education is a much less divisive issue for a representative and his or her constituency than so many other issues that face legislatures -- abortion and the death penalty, for example. Presumably all policymakers agree that improving education is a desirable goal, so it is a politically more palatable issue with which to deal. Moreover, of the many proposed reforms of education, raising salaries of teachers was and is one of the options before the legislature that it could most readily do. [92] In this light, as education rose to the top of the policy agenda as a result of A Nation at Risk and its successors, it was no wonder that many state governments would choose to take decisive action on it.[93]

A further reason why education reform must have appeared to be a worthwhile issue to legislators may have been the relatively united body of opinion among education experts that teacher salaries should be raised. This was particularly notable, because divisions over other educational issues were deep. After all, the first wave of reform certainly did and does have its critics in the education field. Those critics came to formulate an alternative approach to changes in the American education system.[94] This alternative reform movement has

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[90] William Lowe Boyd, "How To Reform Schools Without Half Trying: Secrets of The Reagan Administration", Educational Administration Quarterly, Volume 24, Number 3, August, 1988: p. 302.

[91] Denis Doyle and Terry Hartle, Excellence in Education: The States Take Charge. Washington: American Enterprise Institute, 1985: pp. 13-15.

[92] See: Stephen Jacobson, "The Distribution of Salary Increases and its Effect on Teacher Retention", Education Administration Quarterly, Volume 24, Number 2, May, 1988.

[93] This raises the question of why legislatures did not take action on education issues sooner? Doyle and Hartle argue that education as an issue "lost its luster" for legislatures in the 1970's since the key education issues of that era were highly divisive ones, such as desegregation, collective bargaining and school finance reform. Denis Doyle and Terry Hartle, Excellence in Education: The States Take Charge. Washington: American Enterprise Institute, 1985: pp. 9-11.

[94] The most prominent example would probably be the report by the Carnegie Forum on Education and the Economy, A Nation Prepared: Teachers for The 21st Century. The Report of the Task Force on Teaching As A Profession (1986).

generally been called "second wave reform".[95] This school of thought included many different critiques by different observers of first wave reform, ranging from the argument that first wave was too militaristic in its metaphors, to the argument that its programs would be bad for teacher morale, to the argument that its higher standards were harmful to the disadvantaged, and especially that first wave reform meant too much centralization of education authority, among many more criticisms.[96] However, one of the few areas on which these counter-reformers could agree with their first wave counterparts was that teacher salaries should be raised.[97] In other words, even an education and education policy community that was deeply divided over many other issues could agree on the idea of raising teacher salaries. This surely must have made it clearer to policymakers that raising teacher salaries had wide-ranging support among experts in education matters.

These legislative efforts at reform were clearly correlated with teacher salaries in the United States. In the wake of these actions by state legislatures, teacher salaries made substantial gains on inflation and reclaimed ground that has been lost during the high inflation of the 1970's. Such gains were especially apparent from roughly 1985 to 1988. This is almost certainly a key reason why average teacher salaries nationally are now the highest that they have ever been.[98]

Minnesota's pattern on this score was somewhat different. Like other states, Minnesota's state government was keenly interested in education reform during the 1980's and embarked upon several innovative programs. Unlike other states, however, relatively few of the

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[95] For a relatively sympathetic discussion of "second wave reform", see Bettye MacPhail-Wilcox and Richard King, "Personnel Reforms in Education: Intents, Consequences, and Fiscal Implications", Journal of Education Finance, Volume 14, Summer, 1988. For a discussion of first and second wave reform that is relatively skeptical about the latter, see Michael Kirst, "Recent State Education Reform in the United States: Looking Backward and Forward", Educational Administration Quarterly, Volume 24, Number 3, August 1988.

[96] For a relatively recent example of many of these criticisms, see Mary Hatwood Futrell, "Mission Not Accomplished: Education Reform In Retrospect", Phi Delta Kappan, September 1989. It should be noted that unlike most observers, Futrell notes four waves of 1980's school reform, rather than two. For another recent critique that focuses upon the military metaphors of first wave reform and changes in emphasis likely in school reform in coming years, see Thomas McDaniel, "Demilitarizing Public Education: School Reform in The Era of George Bush", Phi Delta Kappan, September, 1989.

[97] For a clear statement of this argument, see: Stephen Jacobson, "The Distribution of Salary Increases and its Effect on Salary Retention", Educational Administration Quarterly. Volume 24, Number 2, May, 1988.

[98] F. Howard Nelson's 1989 AFT report directly states that "...teacher salaries are at their highest level ever...", by which he means their highest level ever controlling for inflation (though obviously this would also hold true when stated in actual dollars). He also points out, however, that this is not true if one controls for experience; if this is done, the peak year is 1972. F. Howard Nelson, Survey and Analysis of Salary Trends 1989. Washington: American Federation of Teachers, Research Department, 1989: p. 29 and 33.

reforms instituted by Minnesota had a direct impact on teacher salaries, as Minnesota's reforms centered not around teachers and teacher pay, but around school choice issues.[99]

As a result, Minnesota's salary picture over time differed from other states. Relative to other states, Minnesota's average teacher salary started making gains earlier in the 1980's than did teachers nationwide, but also didn't make the kinds of gains that other states' teachers did after 1985. This created a situation in which Minnesota teachers gained significantly on teachers in other states from about 1982-85, but fell back somewhat after that, as Minnesota did not provide the sort of new legislative support for higher teacher salaries seen in other states.

This is a significant reason why Minnesota's ranking in average salary among the 50 states and the District of Columbia peaked at 7th place in 1985, but has slid back down to 15th place in 1989.[100] It is not so much that Minnesota teachers have done poorly during the late 1980's, but that teachers in other states have made significant gains during this time.[101] However, this does cast some doubt on arguments that Minnesota teacher salaries have risen dramatically in the past four years, for their rate of salary growth during this era has often been surpassed elsewhere.

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[99] A good discussion of the highlights of Minnesota school reform in the 1980's can be found in Gary Farland, "Elementary/Secondary Education and the Minnesota Economy",in 1989 Economic Report to the Governor. 1989: pp. 57-61. While Farland's discussion includes the observation that a "continuing increase in funds [was] made available [to Minnesota schools]... from Fiscal Year 1983 to Fiscal Year 1988, expenditures by school districts increased at a rate well above inflation" (p. 57), nowhere is there any evidence presented that such action was geared explicitly toward raising teacher salaries per se.

[100] National Education Association, Rankings of the States. Annual series; and NEA figures published in Education Week, May 9, 1990.

[101] As has been suggested earlier in this report, the strongest education reform thrust in the 1980's, including salary improvement reforms, came in Southern states. These southern states have traditionally had far lower teacher salaries than Minnesota, and still do even after all their efforts at raising teacher salaries. Perhaps, then, programs to raise teacher salaries in Minnesota were not as badly needed as in other states.

Chapter 6. Conclusions and Policy Implications

How Have Teacher Salaries Fared Over The Past Two Decades?

The reader might appropriately ask whether, based on the analysis in this report, teacher salaries have fared well or poorly over the past two decades. The answer is that the findings are open to two somewhat different interpretations, depending on which findings one wishes to emphasize.

> **On one hand, the trend analysis shows that Minnesota teachers lost considerable purchasing power during the decade of the 1970's, and that after controlling for price inflation, increasing levels of teacher training and experience, and urbanization changes, teacher salaries in Minnesota are about 3% higher than their 1974-75 level, but still about 5% lower in real-dollar terms than their 1970-71 peak.**
>
> **On the other hand, the comparisons with other states show that teacher salaries nationally trended in a fairly similar manner over the past two decades, and that Minnesota teacher salaries continue to rank comparatively high, particularly when controlling for cost-of-living differences among the states.**

Both of these descriptive statements are true and directly supported by the data. We leave the evaluation of these findings to the reader, and instead discuss some of their policy implications.

What Factors Have Been Driving Teacher Salaries?

Inflation

Economic inflation, far more than any other factor, has been driving teacher salary increases during the past few decades. It has accounted for an approximate 140% increase in Minnesota teacher salaries since 1974-75. During the highly inflationary decade of the 1970's, the real-dollar value of teacher salaries declined notably, even while salaries increased sharply in nominal-dollar terms. The economic events triggering this development were the national and state economic recession of 1974-75,[102] following the oil price shock resulting from the response of the Arab OPEC nations to the 1973 Yom Kippur War between Israel and Egypt. As the inflationary effects of OPEC actions reverberated through the world economy, a new term, "stagflation", was coined to describe this unusual combination of economic recession and rampant inflation. Not surprisingly, the fiscal capacity of schools was severely stressed and teacher salaries lost ground during this period. This was as much the case in Minnesota as in the rest of the nation.

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[102] According to the National Bureau of Economic Research, the actual period of recession was November, 1973 through March, 1985.

Interestingly, the turning point for the recovery of teacher salaries in Minnesota came during the severe budget crisis that plagued the state in the early 1980's. In a series of regular and special legislative sessions, a number of both modest and more drastic measures were taken in attempting to deal with the persistent state fiscal shortfalls. Several of these measures involved school finance. One result was a behavioral shift on the part of school districts toward increased reliance on the referendum levy to finance their current operating costs. While this may have been viewed as a rather minor policy shift at the time, this dependence has grown considerably during the decade of the 1980's.

The referendum levy has proved to be an important tool for enabling teacher salaries to recover much of the purchasing power they lost in the 1970's. However, increasing referendum levy burdens have come to be viewed as an unnecessary and unfair burden by many educators and property taxpayers, particularly in low-wealth districts.

This history of the past two decades may be directly applicable to the current national and international economic and military situation. Again, the U.S. economy is in a slowdown which has been termed recessionary by a growing number of economists. Likewise, the recent invasion and takeover of Kuwait by Iraqi military forces has dealt world oil prices a shocking, and potentially inflationary blow, which may be felt throughout much of the world economy. While inflationary pressures have been relatively low during the latter half of the 1980's, and though recent energy price increases do not yet appear to be spreading into other areas of the economy, it is not yet known how severe inflationary pressures may become as a result of uncertainties over energy supplies; much depends on whether fighting actually breaks out and how long it lasts. Provided the mideast crisis is quickly resolved, the current recession is expected to dampen inflation in the foreseeable future. On the other hand, a prolonged war or significant damage to Saudi oil production facilities could result in sharply higher oil prices and sharply boost inflation. Meanwhile, the most recent revenue forecasts in Minnesota predict a state budget shortfall for the coming biennium of roughly $1.2 billion. **Thus, the stage might be set for another cycle of erosion in the purchasing power of teacher salaries in Minnesota and throughout the nation.**

However, should this actually happen, there are some important differences that could make the prospect of subsequent recovery of teacher salaries more troublesome this time around.

First, whereas declining enrollments facilitated education budget cutting through teacher layoffs in the early 1980's, increasing enrollments limit the use of this option during the coming decade, given the resulting increased pressure on state resources.

Second, there now may be a diminished capacity in many districts for further increasing referendum levies to compensate for any state budgetary cuts. Some other fiscal tool would likely be required to provide the increased resources that would be demanded for school operating costs.

Third, since 1980 teachers have had the right to strike, and they might not willingly tolerate another cycle of erosion of their standard of living.

Furthermore, it is possible that such a developing scenario would be recognized sooner by everyone, and that teacher demands for salary adjustments would arise more quickly than before. If so, significant teacher salary adjustments could precede general economic recovery, thereby producing a school budgeting crisis that could again result in the elimination of many educational programs and teaching positions.

Since such cuts generally involve the newer, less experienced staff, the remaining teachers would be the more experienced, higher salaried personnel; this would produce a sudden increase in the aggregate average teacher salary figure apart from any change in the actual salaries of individual teachers. The student/staff ratio could again reverse its gradual downward trend and jump significantly upward in many districts, making it more difficult to meet the individual needs of many students, particularly given the growing number of special-need students.[103] **In light of the increased demands being placed on schools,[104] such retrenchment may be more likely than before to impact teacher morale, and thus, the quality of public school education. Whether this rather pessimistic scenario actually unfolds remains to be seen.**

An alternative and more optimistic scenario would predict the avoidance of war in the Mideast, a rather mild national economic recession, the constraint of economic inflation, and a soon revived state economy capable of generating the tax revenues necessary for maintaining or even increasing teacher salaries in Minnesota. **Clearly, the general economic situation merits careful watching.**

Increased Training and Experience

The second factor driving teacher salary increases during the past few decades has been increasing levels of training and experience among the teacher workforce, which accounts for an approximate 17.7% increase in teacher salaries since 1974-75. While this increased training and experience undoubtedly bodes well for the quality of education, **it has increased the pressure on school budgets and is likely to continue to do so for some time.** With the degree of training and experience currently being a factor in the distribution of state aids to schools, this feature of the funding formula is likely to become an increasing point of

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[103] There has been considerable growth during the past two decades in the numbers of special-need students, presumably due to such factors as: increasing pressures on the family system; a sharp increase in the proportion of children living in poverty; an increased occurrence and/or reporting of child neglect and abuse; and increased chemical abuse, including prenatal addiction.

Improved assessment techniques and enhanced awareness of such problems have also contributed to the growth in the number of special-need students, as have the increasing state and federal mandates to serve a broader range of needy students. See: Sally Reed and R. Craig Sautter, "Children of Poverty: The Status of 12 Million Young Americans", Phi Delta Kappan, June, 1990, pp. k1-k12; and Stanley M. Elam, The Second Gallup/Phi Delta Kappa Poll of Teachers' Attitudes Toward the Public Schools. June, 1989.

[104] The increased expectations for schools include such areas as nutrition programs, sex education, multicultural awareness, social-skills training, chemical awareness, suicide counselling, latch-key programs, and expanded programs for both learning-disabled and gifted students.

contention in the legislative arena, assuming that it survives the court challenge now facing the State's funding system.[105]

Increasing Urbanization of the Teacher Force

A factor which has not been very influential on teacher salaries to date, but which may exert upward pressure in the coming decade, is the increasing urbanization of the teacher force in response to general demographic trends. Proportionately more of Minnesota's students and teachers are likely to be living in metropolitan areas in the future; thus, an increased portion of the teacher force is likely to be demanding the higher-level salaries traditionally found in the metro area where living costs and labor costs are higher. Clearly, this factor also bears watching in the coming decade.

Education policymakers will need to be kept apprised of this developing demographic shift in the state's teacher force during the coming decade in order to properly interpret school budgeting requests.

How Important Are The Regional Differences?

The trend analysis revealed noteworthy discrepancies among different types of districts in both 1) teacher training and experience levels and 2) salary levels after controlling for training and experience differences, with the lower paying districts also generally having lower levels of training and experience.

In general, the above-average salaries and training and experience levels are found in two types of districts: 1)large metro districts with declining enrollments; and 2)urban nonmetro and suburban-metro districts with high salary schedules. The lowest average salaries and training and experience levels, on the other hand, are generally found among small, rural districts with declining enrollments.[106]

The latter situation of disadvantage may result as much from the more-limited opportunities for continuing education that teachers in many small rural districts may have as from the higher teacher turnover in such districts. It is reasonable to ask whether such interdistrict salary disparities affect staff morale and the quality of education in lower-paying districts. Given this possibility, this situation of salary disparities among districts bears close watching by educators and policymakers in the future.

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[105] Skeen v State of Minnesota, et. al. and Virginia Independent School District # 706, et. al., No. C7-88-1954 (Wright County District Court).

[106] Not all of the districts in these four clusters have declining enrollments, especially not those in Cluster 3.

What Should Be Made of Minnesota's Relatively High National Ranking?

State by state comparisons of average teacher salaries show Minnesota ranking relatively high throughout the two-decade time frame of this study. In 1989-90, for example, Minnesota ranks 15th using unadjusted data, and 4th when controlling for cost of living differences among the states.

These favorable national rankings reflect Minnesota's strong commitment to education, as well as the relatively disadvantaged situation of teachers in many other states. For example, a recent Harris survey of American teachers, while noting some recent gains, paints a rather dismal portrait of teachers' situation nationally.

> Two critical factors associated with the professional status of teachers -- whether or not they feel respected and their ability to earn a decent salary -- have shown some improvement in the mid-to-late 1980's. . . . Today 48% of teachers believe they can earn a decent salary as a teacher, up from only 37% in 1984. And today 53% of teachers agree that "as a teacher, I feel respected in today's society." In 1984, only 47% agreed. . . . Teachers views about their ability to earn a decent salary also correspond with their evaluation of the quality of education at their schools.[107]

Thus, Minnesota teacher salaries currently appear relatively healthy on the basis of both historical and national comparisons; nevertheless any complacency would be ill-advised. Rather, in the face of impending national economic uncertainty and state budgetary difficulties, the challenge in the 1990's for those concerned about teacher salaries will be to maintain the gains of the 1980's.

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[107] Metropolitan Life Insurance Company and Louis Harris and Associates, Inc. The Metropolitan Life Survey of the American Teacher 1989. May-June, 1989 (Foreword and Chapter 2).

Appendix A. Summary Trend Data

Much of the trend data reported in Chapter 3, as well as other relevant trend data not presented elsewhere in this report, is summarized below in Table A.1. These trend statistics are summarized here without interpretation for the convenience of the reader. This table contains biannual, statewide figures which were initially quite helpful for selecting and verifying the case-selection procedures. Except where otherwise noted, these summary statistics were computed from the individual teacher-level data on the Licensed School Personnel Records Data Base maintained by the Minnesota Department of Education. These summary statistics include: a) the numbers of records corresponding to three cumulatively larger subgroups of school personnel available on the data tapes, as well as the number of Minnesota teachers as reported by the National Center for Education Statistics (NCES)[108]; b) some employment history information for these subgroups; and c) average salary figures calculated for these subgroups, as well as the average salary figure for Minnesota teachers as published by the National Educational Association (NEA).[109]

The average actual salary figure for 1974-75 is an estimate; it could not be calculated directly from individual teacher data, since both the assignment and step and lane data were missing from the 1974-75 data tape, thus making it impossible to distinguish between instructional and administrative personnel. This estimate is based on the finding that our calculations for the two subsequent time periods was a constant 3.92% greater than the average figure reported by the NEA for Minnesota for those years (i.e., our calculation versus the NEA figure was \$14,511/\$13,963=1.0392 for 1976-77, and \$16,117/\$15,509=1.0392 for 1978-79). Assuming that this relationship held for the prior year, as well, the 1974-75 average salary was estimated by multiplying the NEA-reported average salary figure for that year by this ratio (i.e., \$11,756 x 1.039 = \$12,214).

The average actual salary figure for 1980-81 is also an estimate, albeit much more closely tied to the actual individual-level teacher data than is the estimate for 1974. For 1980-81, step and lane information was missing from the teacher data base; for the prior years, this data was the primary means of distinguishing between administrative staff and instructional staff, as well as for screening out temporary teachers being paid on an hourly wage

[108] Digest of Eduction Statistics. U.S. Department of Education, National Center for Education Statistics. Series generally published annually.

[109] These latter figures were initially provided to the NEA from Minnesota's Licensed School Personnel Records Data Base, the principal source of raw data for this study. However, NEA's aggregate published figures cannot be directly used in the present study, since case-level analysis of raw data is required for much of the analysis. In addition, the combination of a) certain information being missing from the earlier raw data tapes which were used in this study and b) the need for comparability in case-selection across the years of the study, have led us to a somewhat different definition of "teacher" than used by the NEA. Thus, the salary figures we present for the three subgroups below are generally somewhat higher than the NEA's salary figures. Nevertheless, NEA's aggregate figures were quite valuable during the design phase of this study, particularly for verifying our case-selection criteria, as well as for making our aggregate salary estimates for 1974-75.

basis.[110] However, 1980-81 happens to also be the earliest year for which assignment information still exists, providing an even more valid means of screening out administrators. Fortunately, most hourly-wage teachers would have been screened out by another criterion, the starting teacher salary in the district. Thus, we were able to calculate with considerable confidence the 1980-81 figures. Based on some related calculations made for some of the other data years, we raised the estimate for 1980-81 from the calculated figure of $18,368 to $18,374 to correct for the slight influence of the remaining hourly wage teachers. Any remaining estimation error is likely to be trivial.

[110] See Chapter 1 for a review of the case selection criteria and procedures.

Table A.1
Statewide Summary Statistics[111]

	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
Missing Information								
Step & Lane	X			X				
Teaching Assignment	X	X	X					
Number Records on Tape								
Total Records	52,087	55,916	55,609	56,566	50,895	51,087	52,293	52,892
A) Teachers Only	—	—	—	40,219	36,343	36,792	38,231	39,400
B) A & Support	—	47,213	44,361	42,963	38,684	39,127	40,677	42,008
C) A, B & Admin.	45,263	50,786	49,275	46,240	41,714	42,209	43,850	45,256
D) NCES Report[112]	43,817	45,024	44,488	44,142	39,775	40,108	40,957	42,540
Percent Rehired								
A) Teachers Only	—	—	—	91.9%	97.5%	93.2%	93.3%	94.0%
B) A & Support	—	92.5%	93.0%	91.9%	97.5%	93.2%	93.2%	94.0%
C) A, B & Admin.	93.0%	92.4%	92.8%	92.1%	97.4%	93.2%	93.0%	94.0%
Average Years of Experience								
A) Teachers Only	—	—	—	14.3	15.8	16.4	16.7	16.9
B) A & Support	—	13.8	14.4	14.5	15.9	16.5	16.6	16.9
C) A, B & Admin.	14.8	14.3	14.7	15.0	16.4	17.0	17.0	17.3
Average Salary								
A) Teachers Only	—	—	—	$18,184	$23,074	$25,867	$28,864	$31,223
B) A & Support	$12,214[113]	$14,511	$16,117	$18,374	$23,251	$26,058	$29,065	$31,421
C) A, B & Admin.	$12,808	$15.039	$16,790	$19,168	$24,134	$27,021	$30,102	$32,543
D) NEA[114]	$11,756	$13,963	$15,509	$17,777	$22,876	$25,450	$28,340	$30,660
Avg. Salary / NEA Salary								
A / NEA Salary	—	—	—	1.023	1.009	1.016	1.018	1.018
B / NEA Salary	—	1.039	1.039	1.034	1.016	1.024	1.026	1.025
C / NEA Salary	1.089	1.077	1.083	1.078	1.055	1.062	1.062	1.061
Average Salary: Pct. Change								
A) Teachers Only	—	—	—	—	26.9%	12.1%	11.6%	8.2%
B) A & Support	—	—	11.1%	14.0%	26.5%	12.1%	11.5%	8.1%
C) A, B & Admin.	—	17.4%	11.6%	14.2%	25.9%	12.0%	11.4%	8.1%
D) NEA	—	18.8%	11.1%	14.6%	28.7%	11.3%	11.4%	8.2%
Average Salary: Differences								
A - B	—	—	—	($190)	($177)	($191)	($201)	($198)
B - C	—	($528)	($673)	($794)	($883)	($963)	(1,037)	($1,122)
Average Salary: Standard Dev.								
B) A & Support	—	$3,857	$4,201	$4,717	$5,336	$5,965	$6,536	$7,025
Average Salary: S.D. as % of Mean								
B) A & Support	—	26.6%	26.1%	25.7%	22.9%	22.9%	22.5%	22.4%

[111] These figures are based upon our analysis of the MDE's Licensed Personnel Data Base.

[112] U.S. Department of Education, National Center for Education Statistics, Digest of Eduction Statistics. Series generally published annually.

[113] This figure and the 1980-81 figure in this line are estimates, as noted in the preceding text.

[114] Data source: National Education Association, Ranking of the States. Annual Series. NEA, Estimates of School Statistics. Annual series. Washington, D. C.

Appendix B. Price Inflation Adjustment Methodology

In comparing teacher salaries over a period of time, our interest is not in the nominal or face-value of those salaries, but in their real value in terms of the standard of living those salaries could buy for the people earning them. Thus, it is necessary to control for the effects of price inflation from one year to the next. Typically, the preferred method for doing this is through the application of a price index.

Price indices are statistical mechanisms, actually ratios, designed to compare relative changes in the price of goods and services over time. Different price indices have been developed for different purposes. The index most appropriate for this application is the GNP Implicit Price Deflator.[115] Like the well known Consumer Price Index (CPI), the GNP Implicit Price Deflator is sensitive to changes in the prices of services, as well as goods. However, an important advantage of this particular price index in contrast to the CPI is that it allows for consumer substitution effects associated with inflation. That is, whereas the CPI measures the price of a fixed basket of goods and services, the GNP Implicit Price Deflator is sensitive to changes in the basket of goods and services that consumers are willing to buy when confronted with price changes.[116] Thus, it is a better approximation of the concept of cost-of-living, since teachers may indeed make substitutions in the basket of goods and services they consume as their prices fluctuate.

Table B.1, Row A, presents the GNP Implicit Price Deflator for each calendar year during the time frame of this study. Row B presents for each school year the average of the two corresponding calendar years' ratios. It is this average which is used in Chapter 3 to adjust nominal teacher salaries for the effects of price inflation. Row C standardizes this average ratio by dividing it by 56.65, its value in 1974-75, the base school-year of this study. The standardized figures of Row C reveal that the value of the GNP Implicit Price Deflator rose by 118.53% during the 14-year period of this study.

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[115] Other popular price indices include the Consumer Price Index (CPI), the Producer Price Index (PPI), and the GNP Fixed-Weighted Index.

[116] For example, a sharp rise in the price of red meat may trigger a substitution of poultry and/or fish in consumers' purchases.

Table B.1
GNP Implicit Price Deflator: 1974-1989[117]

	1974	1975	1976	1977	1978	1979	1980	1981
A. By Calendar Year	54.0	59.3	63.1	67.3	72.2	78.6	85.7	94.0
	1982	1983	1984	1985	1986	1987	1988	1989
Calendar Yr (Cont.)	100.0	103.9	107.7	110.9	113.9	117.7	121.3	126.3
	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
B. By School Year	56.65	65.20	75.40	89.85	101.95	109.30	115.80	123.80
C. Using 1974-75 As Base Year	100.00	115.09	133.10	158.61	179.96	192.94	204.41	218.53

[117] These data are taken from The Economic Report of the President, 1989. Washington, D.C.: Table B-3, pp. 312-313.

Appendix C. Training And Experience Adjustment Methodology

Training and experience matrices are a nearly universal tool underlying the compensation of public school teachers. Typically, a training and experience matrix is a two-dimensional grid or table in which the columns (or rows) correspond to ranked levels of formal teacher training (e.g., BA, BA + 15 credits, etc.) and the rows (or columns) correspond to ranked years of teaching (or teaching-related) experience. The increments associated with levels of training are typically referred to as "lanes", while the increments associated with years of experience are typically referred to as "steps". Associated with each cell of the table or grid is a salary figure, which is the base salary paid to a teacher having the corresponding levels of formal education and years of experience. The entire matrix is often referred to as a "step and lane grid" or simply a "salary matrix".

It would be quite rare for the salary matrices of any two school districts to be identical. They often differ in terms of the numbers of lanes and/or steps specified. For example, one district may have a separate lane corresponding to BA + 60 credits, while another district may skip this distinction in going directly from a BA + 45 credits lane to an MA lane. Most districts recognize a maximum of about 20 years of experience, though some show greater differentiation than others. For example, one district may treat each year of experience up to 20 years as separate steps, while another district may combine 15-19 years experience into a single step.

However, the major difference between the salary matrices of different districts regards the salary figures in the cells of the grid. Some districts simply pay more than others, and some districts have more variation in pay rates than others. For example, one district may pay a teacher with an MA degree + 60 credits and 10 years experience at twice the level of a starting teacher, while another district may pay the former at only one-and-one-half times the latter.

Each biennium the Department of Education, using teacher-level data from each of Minnesota's school districts, computes a "Training and Experience Index" for each school district.[118] This "T&E Index", as it is called, is a summary measure of the average training and experience level for the teachers within a district. The T&E Index is used directly in the State's school funding formula.

The first step in computing the index for a given year is to create the statewide "coefficient matrix", which involves:

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[118] The data are reported on Form ED-00255-01, "Elementary, Secondary and Post-Secondary Personnel Record Forms". Only data for full-time personnel with a step and lane designation are used in the computations. The data are reported using a standardized step and lane matrix format which eliminates the differences in the structure of the salary matrix (but not pay-level differences) among districts. In this way, any unique local salary constructs will not influence the computation of the Training and Experience Index, so that the index of any district may be meaningfully compared to that of any other.

a) calculating the average salary for the qualifying teachers in each cell of the standardized step and lane matrix;[119]

b) using regression analysis procedures to smooth the average salary figures to insure an orderly progression of salary increments from the beginning teacher cell (i.e., a BA with no experience) to the highest teacher cell (i.e., a doctorate with 20 or more years experience);[120] and

c) converting the smoothed average salary figure in each cell into a ratio by dividing it by the smoothed average salary figure of the starting teacher cell. Thus, the ratio for the starting teacher cell is always 1.0, while all higher cells will be greater than 1.0 and increase fairly smoothly with increasing training and/or increasing experience to reflect the increasing pay levels associated with increased training and experience. (See Table C.1.)

Typically, this smoothed statewide coefficient matrix is then applied to the actual distribution of each district's teaching staff to calculate the district's training and experience index for that year. However, that is not done for the present study since the focus is on comparing the statewide average from one year to the next, rather than on comparing individual school districts within a given year. Instead, for each year of the study the smoothed coefficients are applied to all qualifying teachers from all districts combined to produce a statewide training and experience index for that year.

Normally, there are two sources of change in a training and experience index from one year to the next.

1) An index could change because individual teachers move from one cell to the next due to having another year of experience, and sometimes as a result of attaining more formal education; and

2) An index could change as a result of an adjustment in the salaries paid to teachers within each step and lane combination, since unless the salary increases in the numerous cells of the matrix are exactly proportional (which is never the case for all

[119] For purposes of calculating this statewide coefficient matrix, teachers' school district identifiers are ignored, such that teachers from all districts are combined into statewide groupings based only on their step and lane identifiers.

[120] The smoothing is required to eliminate inconsistencies which occasionally arise in the pattern of salary averages among the cells of the matrix, particularly in cells having only a few teachers statewide.

Table C.1
Teacher Salary Schedule: Smoothed Coefficient Matrix[121]

YEARS OF EXPERIENCE	LEVEL OF TRAINING						
	2-YR[122]	3-YR	BA	BA+15	BA+30	BA+45	BA+60
1	0.99	1.00	1.0000	1.0282	1.0563	1.0845	1.1127
2	1.02	1.02	1.0256	1.0583	1.0910	1.1236	1.1563
3	1.04	1.04	1.0511	1.0884	1.1256	1.1628	1.2000
4	1.06	1.06	1.0767	1.1184	1.1602	1.2020	1.2437
5	1.08	1.08	1.1023	1.1485	1.1948	1.2411	1.2874
6	1.11	1.12	1.1278	1.1786	1.2294	1.2803	1.3311
7	1.14	1.15	1.1534	1.2087	1.2641	1.3194	1.3748
8	1.16	1.17	1.1789	1.2388	1.2987	1.3586	1.4184
9	1.18	1.19	1.2045	1.2689	1.3333	1.3977	1.4621
10	1.20	1.22	1.2301	1.2990	1.3679	1.4369	1.5058
11	1.23	1.25	1.2556	1.3291	1.4026	1.4760	1.5495
12	1.25	1.28	1.2812	1.3592	1.4372	1.5152	1.5932
13	1.27	1.30	1.3068	1.3893	1.4718	1.5543	1.6368
14	1.29	1.32	1.3323	1.4194	1.5064	1.5935	1.6805
15	1.31	1.35	1.3579	1.4495	1.5411	1.6326	1.7242
16	1.32	1.37	1.3835	1.4796	1.5757	1.6718	1.7679
17	1.33	1.38	1.4090	1.5097	1.6103	1.7109	1.8116
18	1.34	1.39	1.4346	1.5398	1.6449	1.7501	1.8553
19	1.35	1.40	1.4602	1.5699	1.6795	1.7892	1.8989
20 +	1.36	1.41	1.4857	1.5999	1.7142	1.8284	1.9426

YEARS OF EXPERIENCE	LEVEL OF TRAINING						
	MA	MA+15	MA+30	MA+45	MA+60	SP	PHD
1	1.1348	1.1898	1.2449	1.3000	1.3550	0.9598	1.6933
2	1.1751	1.2320	1.2890	1.3459	1.4028	1.0549	1.6987
3	1.2155	1.2743	1.3330	1.3918	1.4506	1.1470	1.7078
4	1.2558	1.3165	1.3771	1.4377	1.4983	1.2362	1.7206
5	1.2962	1.3587	1.4211	1.4836	1.5461	1.3225	1.7369
6	1.3365	1.4009	1.4652	1.5296	1.5939	1.4060	1.7570
7	1.3769	1.4431	1.5093	1.5755	1.6417	1.4865	1.7806
8	1.4172	1.4853	1.5533	1.6214	1.6895	1.5641	1.8079
9	1.4575	1.5275	1.5974	1.6673	1.7372	1.6387	1.8388
10	1.4979	1.5697	1.6415	1.7132	1.7850	1.7105	1.8734
11	1.5382	1.6119	1.6855	1.7592	1.8328	1.7794	1.9116
12	1.5786	1.6541	1.7296	1.8051	1.8806	1.8454	1.9535
13	1.6189	1.6963	1.7736	1.8510	1.9284	1.9085	1.9990
14	1.6593	1.7385	1.8177	1.8969	1.9761	1.9686	2.0481
15	1.6996	1.7807	1.8618	1.9428	2.0239	2.0259	2.1009
16	1.7399	1.8229	1.9058	1.9888	2.0717	2.0802	2.1573
17	1.7803	1.8651	1.9499	2.0347	2.1195	2.1317	2.2173
18	1.8206	1.9073	1.9940	2.0806	2.1673	2.1802	2.2810
19	1.8610	1.9495	2.0280	2.1265	2.2151	2.2258	2.3483
20 +	1.9013	1.9917	2.0821	2.1725	2.2628	2.2686	2.4193

[121] These coefficients are based on 1982-83 data and were provided by the Minnesota Department of Education, School Aids and Levies Section.

[122] The columns for 2-years and 3-years of teacher training are not normally included when calculating the smoothed coefficients since there are few certified teachers with this little training remaining in the workforce. However, for the sake of completeness we added these two columns by applying a judgmental smoothing procedure to the actual average salaries for teachers at these two levels of training.

districts simultaneously), then the smoothed coefficients for the cells will change somewhat from one year to the next.[123]

Our goal here is to measure the statewide training and experience level of the teacher force in a manner which can be directly compared from year to year. That is, the goal is to measure the first type of change above, but not the second type of change. Thus, it is necessary to hold constant the structure of the step and lane matrix itself, including the smoothed coefficients. When this is done, any change in the index from year to year will reflect only the shifts of the teaching force among the cells of the matrix. Consequently, the 1982-83 coefficients[124] are used for each year of the study. The statistic calculated according to this procedure will be referred to as the "Modified Training and Experience Index", and it is proposed as being a valid summary measure of the training and experience level of the statewide teacher force for each year of the study. These figures are presented in Table C.2.

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[123] In actuality, the matrix of smoothed coefficients generally changes little from year to year, since Minnesota's 435 school districts seldom move in unison in implementing structural changes to their salary schedules. For example, it would be rare for a considerable number of districts to increase simultaneously the salary of starting teachers relative to that of more experienced teachers, a structural change which would compress all other ratios in the salary matrix.

[124] It was felt that it would be most representative to use a data year near the middle of the 14-year period covered by this study. As noted earlier, step and lane information was not available for 1980-81, thereby eliminating that year from consideration for this purpose.

Table C.2
Modified Training & Experience Index: 1974-1988

	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
Modified T&E Index	1.447[125]	1.486	1.525	1.564	1.606	1.635	1.636	1.647
Normalized to 1974	**100.00**	**102.70**	**105.39**	**108.09**	**111.00**	**112.99**	**113.06**	**113.82**
Percentage Change From Prior Period	—	2.7%	2.6%	2.6%	2.7%	1.8%	0.1%	0.7%
Percentage Change Since 1974-75	—	2.7%	5.4%	8.1%	11.0%	13.0%	13.1%	13.8%

[125] The modified training and experience index could not be calculated directly for 1974-75 and 1980-81, given the absence of step and lane data for these two school years. The figures presented are estimates based on extrapolation of the 1976-77 to 1978-79 interval.

Appendix D. Urbanization Adjustment Methodology

School finance professionals have long been aware of the fact that teachers' salaries are generally higher in urban areas than in rural areas. For example, a recent report by the Legislative Audit Commission reported that teachers' salaries average about 9% higher in the 7-county metropolitan area than in greater Minnesota.[126] Even the most cursory review of a district by district listing of average salaries will reveal that even in greater Minnesota the districts encompassing regional centers generally pay teachers more than the surrounding rural districts. Thus, any shift of the state's school-aged population, and hence its teachers, from rural districts to more urbanized districts might be expected to exert an upward influence on the statewide average salary figure for teachers; this is hypothesized in Chapter 3.

Creating The Urbanization Classification Schema

In order to test this hypothesis and statistically control for any such effects, it is necessary to operationally define the concept of "urban". Perhaps the most frequently used operationalization of this concept has been the U.S. Census Department's designation of certain counties as belonging to Standard Metropolitan Statistical Areas (SMSA's). Alternatively, the operationalization could be based on the population size of a district, the presence of specific services and institutions, population density, and so on.

For purposes of this study, we decided that it would be most meaningful to distinguish between three levels of district urbanization based on the dual criteria of school size, as measured by average daily membership (ADM),[127] and population density, as measured by average daily membership per square mile in the district (ADM/Sq. M).

The rationale for using these dual criteria in an operational definition is as follows. The concept of urban generally implies the existence of a broad range of services and institutions in a population center. In the absence of a direct measure of the community services and institutions typically associated with more urbanized areas, researchers often use population size as a proxy measure since it generally takes a sizable population to support such services and institutions. However, such population figures are not available at the school district level on a yearly basis; hence, we substitute student population figures in the form of average daily membership (ADM). The use of ADM per square mile as a second criterion is to control for the fact that some school districts encompass far more geographic area than others and thereby have sizable ADM figures without necessarily becoming highly urbanized; that is, sufficient population density may not yet have been achieved to have transformed

[126] Minnesota Legislative Audit Commission, Statewide Cost of Living Differences, January, 1989 (LAC Report 89-01).

[127] Average daily membership (ADM) is a simple count of the number of students in a district. All students are weighted equally; hence, ADM calculations do not differentiate based on the class level of students nor their days of absence. For the legal definition, see Minnesota Statutes, section 124.17).

the district into an urban area. Thus, both district population size and density are used to operationalize the concept of urban.

Given this choice of criteria, the process of establishing cutoffs signifying degrees of urbanization was as follows. First, we obtained the average daily membership figures for each year of this study and the square mileage data for each of Minnesota's 435 school districts.[128] Then, for each year of the study the districts were ranked in descending order by district density and listed for review. District size was also listed for secondary consideration, though this variable was not used in ranking the districts. The general logic was to search for cutoffs which would divide districts into groups which intuitively seem to make sense, so that the typology would have considerable face validity. In searching these listings for cutoff values to define the three categories of urbanization, it became clear that it would be necessary to adjust any selected values for declining enrollments.[129] After an involved process of iteratively proposing, implementing, reviewing and subjectively evaluating potential cutoff values, we arrived at the following operational definitions of three categories of school districts to reflect three levels of urbanization.

Type I Districts: Highly Urban

To be classified as Type I Urban, the density (ADM per square mile) of the school district must be greater than or equal to 27.36 in 1986-87. This criterion is adjusted for each year of the study based on changes in the statewide school enrollment figure (ADM). (See Table D.1.)

It was deemed necessary to make two exceptions to this density criterion: Austin (district 492) was classified as Type II, even though its density measure would have qualified it for Type I for year 1974-75 and earlier; and Moorhead (district 152) was classified as Type I, even though its density fell somewhat short of the cutoff value. In a related decision, we allowed Dilworth (district 147) to remain classified as Type I on the basis of its high density, even though it has an unusually small ADM size compared with other Type I schools. The reasoning is that both the Moorhead and Dilworth school districts are an integral part of the Fargo-Moorhead metropolitan area and thus merit the Type I classification.

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[128] For the few dozen special educational cooperative districts and the dozen or so vocational center districts, rather than undertake the tedious and questionable process of determining their areas in order to calculate their ADM per square mile, we have simply assumed that all of these districts are non-urban, except for the following 4 districts which we assume to be Type I Urban (i.e., the highest level): 916, N.E. Metro Technical; 917, Dakota County Technical; 930, Carver-Scott Counties Special Ed. Coop; and 287, Hennepin Technical.

[129] School enrollment declines (and, hence, declining densities) were pervasive during most of the 14-year study period. However, it seems logical that an enrollment decline would not signal an urbanization decline in a district, at least not immediately. Thus, it is reasonable to adjust the urbanization density criterion for declining enrollments in a proportionate manner. For logical and empirical consistency, the secondary criterion, ADM, is also adjusted for declining enrollments.

Type II Districts: Moderately Urban

To be classified as Type II Urban, a district's density must be less than the cutoff for Type I above, but its size must be greater than 3250 in 1986-87. As with the density criterion, this size criterion is adjusted for each year of the study based on changes in the statewide school enrollment figure (ADM). (See Table D.1.) The only exceptions have already been noted in the previous paragraph.

Type III Districts: Non-Urban

This is a residual category, containing all districts not classified as being either Type I or Type II.

Table D.1
Urban Classification Criteria And
Adjustments For ADM Changes: 1974-1988

	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
A. For Type I Urban Minimum Density Criterion (ADM/Sq.M)	35.672	34.555	32.393	30.295	28.669	28.056	27.360	29.127
B. For Type II Urban Minimum Size Criterion (ADM)	4,237	4,105	3,848	3,599	3,406	3,333	3,250	3,460
C. Total State ADM	884,602	856,916	803,280	751,254	710,944	695,749	678,481	722,309
Percentage Change Since 1974-75	—	-3.1%	-9.2%	-15.1%	-19.6%	-21.3%	-23.3%	-18.3%
Enrollment-Based Adjustment From 1986-87 Values[130]	1.3038	1.2630	1.1839	1.1073	1.0478	1.0255	1.000	1.0646

[130] The choice of a data year to start the search for reasonable cutoff values for the district size and density criteria was quite arbitrary; the data year 1986-87 was used since it was the most recent available at the time this urbanization typology construction began. Hence, the adjustments for other years of the study are scaled to 1986-87, which by sheer coincidence happened to be the year with the smallest statewide average daily membership; hence, the adjustment coefficients for other years are all greater than 1.0.

Table D.2 lists the school districts which according to these procedures have been classified as being urban at any time during the study period, as well as a few Type III Non-Urban districts for comparison. These districts are sorted in ascending order by their classification in each year of the study, starting with the most recent year and working backwards to the earliest year, and secondarily by district density (ADM per square mile) in 1986-87. Next to each district is a flag indicating the classification given the district in each year of the study. In evaluating this typology, it is instructive to study first the Type I versus Type II differentiation in the most current year of the study. However, it is also important to study any changes in district classifications from one year to the next, since such changes from year to year reflect the process of urbanization occurring for specific districts.
The listings of Table D.2 can be interpreted as follows. The first 42 school districts were classified as Type I Urban throughout the entire 14-year time period of this study. Nearly all of these districts lie within the Twin Cities metropolitan area. The exceptions include Rochester (535), Duluth (709), Mankato (77), and St. Cloud (742), as well as Moorhead (152) and its suburb of Dilworth (147).[131]

The next eight districts (ranks 43 to 50) are classified according to the density criterion as becoming Type I Urban during the 14-year study period. Seven of these 8 districts initially are classified as Type III Non-Urban in 1974-75, based on both insufficient density for the Type I Urban rating and insufficient size for the Type II Urban classification. The other, Forest Lake (831), initially is classified as Type II Urban based on its large size, but lacks sufficient density for a Type I Urban classification until somewhat later. During the study period each of these eight districts grew sufficiently to reach the density criterion to become Type I Urban. Most of these eight districts lie within the high-growth Twin Cities to St. Cloud or Twin Cities to Rochester corridors or the exurban Twin Cities area.

The next eleven districts (ranks 51 to 61) are classified as Type II Urban throughout the period of the study. With the exception of Hastings (200), these districts all contain mid-sized greater Minnesota cities having fairly stable or somewhat declining populations and being generally regarded as regional centers. Hastings appears to be the only one of these eleven districts growing toward a Type I Urban classification; the other ten districts generally have stable or declining enrollments.

The next four districts (ranks 62 to 65) are initially classified as Type III Non-Urban, but shifted into the Type II Urban classification during the period of the study. Three of these four districts are in high-growth Twin Cities exurban areas and are quite likely headed toward Type I Urban classification within the foreseeable future (St Francis (15), Cambridge (911), and Buffalo (877)).

The 24 districts listed last in Table D.2 (ranks 68 to 91) are classified as Type III Non-Urban throughout the time frame of this study. These districts have the highest densities of the hundreds of Type III Non-Urban districts, and they are listed merely for comparison.

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[131] The district of Hopkins-Golden Valley (270) was formed in 1980 through the merger of the Hopkins (274) and Golden Valley (275) districts. Based on the density criterion, both of these component districts were classified as Type I Urban since the beginning period of this study, as is the combined district since their merger.

Table D.2
Urbanization Classification Of
Minnesota School Districts: 1974-1988

Rank[132]	ID #	Name	74-75	76-77	78-79	80-81	82-83	84-85	86-87	88-89
1	991	MINNEAPOLIS	1	1	1	1	1	1	1	1
2	6	SOUTH ST. PAUL	1	1	1	1	1	1	1	1
3	14	FRIDLEY	1	1	1	1	1	1	1	1
4	13	COLUMBIA HEIGHTS	1	1	1	1	1	1	1	1
5	625	ST. PAUL	1	1	1	1	1	1	1	1
6	281	ROBBINSDALE	1	1	1	1	1	1	1	1
7	273	EDINA	1	1	1	1	1	1	1	1
8	286	BROOKLYN CENTER	1	1	1	1	1	1	1	1
9	283	ST. LOUIS PARK	1	1	1	1	1	1	1	1
10	282	ST. ANTHONY-NEW BR.	1	1	1	1	1	1	1	1
11	271	BLOOMINGTON	1	1	1	1	1	1	1	1
12	147	DILWORTH	1	1	1	1	1	1	1	1
13	280	RICHFIELD	1	1	1	1	1	1	1	1
14	623	ROSEVILLE	1	1	1	1	1	1	1	1
15	621	MOUNDS VIEW	1	1	1	1	1	1	1	1
16	279	OSSEO	1	1	1	1	1	1	1	1
17	191	BURNSVILLE	1	1	1	1	1	1	1	1
18	270	HOPKINS	1	1	1	1	1	1	1	1
19	622	NORTH ST. PAUL-MAPLE.	1	1	1	1	1	1	1	1
20	16	SPRING LAKE PARK	1	1	1	1	1	1	1	1
21	11	ANOKA	1	1	1	1	1	1	1	1
22	624	WHITE BEAR LAKE	1	1	1	1	1	1	1	1
23	276	MINNETONKA	1	1	1	1	1	1	1	1
24	199	INVER GROVE	1	1	1	1	1	1	1	1
25	197	WEST ST. PAUL	1	1	1	1	1	1	1	1
26	284	WAYZATA	1	1	1	1	1	1	1	1
27	272	EDEN PRAIRIE	1	1	1	1	1	1	1	1
28	196	ROSEMOUNT	1	1	1	1	1	1	1	1
29	12	CENTENNIAL	1	1	1	1	1	1	1	1
30	833	SOUTH WASHINGTON	1	1	1	1	1	1	1	1
31	277	WESTONKA	1	1	1	1	1	1	1	1
32	719	PRIOR LAKE	1	1	1	1	1	1	1	1
33	832	MAHTOMEDI	1	1	1	1	1	1	1	1
34	535	ROCHESTER	1	1	1	1	1	1	1	1
35	834	STILLWATER	1	1	1	1	1	1	1	1
36	720	SHAKOPEE	1	1	1	1	1	1	1	1
37	77	MANKATO	1	1	1	1	1	1	1	1
38	278	ORONO	1	1	1	1	1	1	1	1
39	112	CHASKA	1	1	1	1	1	1	1	1
40	709	DULUTH	1	1	1	1	1	1	1	1
41	742	ST. CLOUD	1	1	1	1	1	1	1	1
42	152	MOORHEAD	1	1	1	1	1	1	1	1

1 = Type I Urban 2 = Type II Urban 3 = Type III Non-Urban

[132] This ranking is based on district density (ADM per square mile) in 1986-87, which as noted earlier was the most recent year of data available when this analysis was begun. Such rankings are fairly stable from year to year, though not entirely so. However, for purposes of this analysis it is not the specific ranking of a district that is important, but its classification in any given year.

Table D.2 (Continued)
Urbanization Classification Of
Minnesota School Districts: 1974-1988

Rank	ID #	Name	1974	1976	1978	1980	1982	1984	1986	1988
43	194	LAKEVILLE	3	1	1	1	1	1	1	1
44	883	ROCKFORD	3	3	1	1	1	1	1	1
45	831	FOREST LAKE	2	2	2	2	1	1	1	1
46	728	ELK RIVER	3	2	2	2	1	1	1	1
47	748	SARTELL	3	3	3	3	3	3	1	1
48	192	FARMINGTON	3	3	3	3	3	3	1	1
49	882	MONTICELLO	3	3	3	3	3	3	1	1
50	885	ST. MICHAEL-ALBE.	3	3	3	3	3	3	1	1
51	492	AUSTIN	2	2	2	2	2	2	2	2
52	200	HASTINGS	2	2	2	2	2	2	2	2
53	241	ALBERT LEA	2	2	2	2	2	2	2	2
54	656	FARIBAULT	2	2	2	2	2	2	2	2
55	347	WILLMAR	2	2	2	2	2	2	2	2
56	761	OWATONNA	2	2	2	2	2	2	2	2
57	861	WINONA	2	2	2	2	2	2	2	2
58	181	BRAINERD	2	2	2	2	2	2	2	2
59	701	HIBBING	2	2	2	2	2	2	2	2
60	31	BEMIDJI	2	2	2	2	2	2	2	2
61	318	GRAND RAPIDS	2	2	2	2	2	2	2	2
62	15	ST. FRANCIS	3	3	2	2	2	2	2	2
63	911	CAMBRIDGE	3	3	2	2	2	2	2	2
64	206	ALEXANDRIA	3	3	2	2	2	2	2	2
65	877	BUFFALO	3	3	3	3	2	2	2	2
68	99	ESKO	3	3	3	3	3	3	3	3
69	94	CLOQUET	3	3	3	3	3	3	3	3
70	697	EVELETH	3	3	3	3	3	3	3	3
71	879	DELANO	3	3	3	3	3	3	3	3
72	454	FAIRMONT	3	3	3	3	3	3	3	3
73	141	CHISAGO LAKES	3	3	3	3	3	3	3	3
74	695	CHISHOLM	3	3	3	3	3	3	3	3
75	727	BIG LAKE	3	3	3	3	3	3	3	3
76	47	SAUK RAPIDS	3	3	3	3	3	3	3	3
77	659	NORTHFIELD	3	3	3	3	3	3	3	3
78	256	RED WING	3	3	3	3	3	3	3	3
79	750	COLD SPRING	3	3	3	3	3	3	3	3
80	423	HUTCHINSON	3	3	3	3	3	3	3	3
81	700	HERMANTOWN	3	3	3	3	3	3	3	3
82	531	BYRON	3	3	3	3	3	3	3	3
83	704	PROCTOR	3	3	3	3	3	3	3	3
84	717	JORDAN	3	3	3	3	3	3	3	3
85	829	WASECA	3	3	3	3	3	3	3	3
86	508	ST. PETER	3	3	3	3	3	3	3	3
87	204	KASSON-MANTORVILLE	3	3	3	3	3	3	3	3
88	138	NORTH BRANCH	3	3	3	3	3	3	3	3
89	300	LA CRESCENT	3	3	3	3	3	3	3	3
90	413	MARSHALL	3	3	3	3	3	3	3	3

1 = Type I Urban 2 = Type II Urban 3 = Type III Non-Urban

Table D.3 summarizes these classification data, showing the number of districts of each type for each year of this study. During this 14-year period, the number of Type I Urban districts has increased by eight, the Type II Urban Districts have increased by three, and the Type III Non-Urban districts have decreased by 16, with the difference due to the loss of five districts through mergers.[133] Thus, the classification data of Tables D.2 and D.3 project considerable face validity in that they capture the dynamic urbanization trends among Minnesota's school districts, particularly the changes occurring in the Twin Cities exurban areas.

Table D.3
Summary Urbanization Classification
Of Minnesota School Districts: 1974-1988

	1974-75	1976-77	1978-79	1980-81	1982-83	1984-85	1986-87	1988-89
A. Type I Urban	42	43	44	44	46	46	50	50
B. Type II Urban	12	13	16	16	15	15	15	15
C. Type III Urban	384	382	377	374	373	372	368	368
Total[134]	438	438	437	434	434	433	433	433

Applying The Urbanization Classification Schema

The purpose of creating this urbanization classification schema or typology is to provide a means for measuring the degree of urbanization of Minnesota's teacher force in order to determine whether and to what extent this factor has been responsible for any of the teacher salary increases during the 14-year study period. The procedure for calculating the urbanization adjustment factor is as follows.

[133] In none of these five cases has the merger resulted in a change of classification.

[134] During the 14-year period of this study, there were five school district mergers: Kerkoven and Murdock, 1978; Blue Earth and Frost, 1979; Heron Lake and Okabena, 1979; Hopkins and Golden Valley, 1980; and Mountain Iron and Buhl, 1984. For any given data year, the analysis is based on the districts existing in that year; thus, the total figures reflect the decline of 5 districts during the study period. Two school districts, Prinsburg and Franconia, are not included here since they are non-operating district and, thus, employ no teachers.

1) For each study year, calculate the statewide average teacher salary figure without regard for the urbanization classifications. These figures are presented in part D of Table D.4.

1) For each study year calculate the number of teachers within each of the three classes of school districts, as well as their average salary. These figures are also presented in parts A, B and C of Table D.4.

2) For the first year of the study, 1974-75, calculate the proportion of teachers in each of the three urbanization categories. These three proportions are also presented in parts A, B and C of Table D.4. For comparison, comparable figures showing the distribution of teachers among the three categories are presented for subsequent years, as well; however, these latter figures are not used in any further calculations.

4) For each study year, calculate the statewide adjusted average salary as a weighted average of the average salary figures for the three categories of teachers, where the weights are the corresponding proportions of teachers in those categories for the first year of the study, 1974-75. This figure is an estimate of the statewide average salary figure which would have occurred had the degree of urbanization not changed since the 1974-75. These figures are also presented in part E of Table D.4.

5) For each study year, calculate the urbanization adjustment factor as the ratio of the statewide adjusted average salary figure (from step 4 above) to the statewide average salary figure (from step 3 above). This ratio expresses how much greater (if positive) or less (if negative) the average teacher salary would be in a given year if the degree of urbanization had not changed since 1974-75. These figures are presented in part F of Table D.4. In Chapter 3, these urbanization adjustment factors are applied to corresponding teacher salary trend figures to control for the effects of changing urbanization of the state's teacher force (See Table 3.1).

Table D.4
Calculating The Statewide Urbanization Adjustment Factor
For Minnesota School Districts: 1974-1988[135]

	TYPE I URBAN (A)			TYPE II URBAN (B)			TYPE III NON-URBAN (C)			STATEWIDE TOTAL (D)	
	TEACHERS		AVERAGE	TEACHERS		AVERAGE	TEACHERS		AVERAGE	NUMBER	AVERAGE
YEAR	NUMBER	PROP.	SALARY	NUMBER	PROP.	SALARY	NUMBER	PROP.	SALARY	TEACHERS	SALARY
74-75	22,614	.4996	$14,043	3,184	.0703	$12,432	19,465	.4300	$11,435	45,263	$12,808
76-77	22,908	.4852	$16,138	3,921	.0830	$14,364	20,384	.4317	$12,711	47,213	$14,511
78-79	21,385	.4821	$17,966	4,362	.0983	$15,693	18,614	.4196	$14,092	44,361	$16,117
80-81	21,726	.4699	$21,366	4,558	.0986	$18,708	19,956	.4316	$16,881	46,240	$19,168
82-83	18,833	.4868	$25,649	3,450	.0892	$23,203	16,401	.4240	$20,507	38,684	$23,251
84-85	19,021	.4861	$28,858	3,517	.0899	$25,815	16,589	.4240	$22,900	39,127	$26,058
86-87	20,872	.5131	$31,816	3,647	.0897	$29,106	16,158	.3972	$25,503	40,677	$29,065
88-89	21,974	.5231	$34,051	3,761	.0895	$31,561	16,273	.3874	$27,837	42,008	$31,421

	STATEWIDE AVERAGE SALARY		ADJUSTMENT
YEAR	ACTUAL	ADJUSTED	FACTOR
	(D)	(E)	(F)
1974-75	$12,808*	$12,808*	.0000
1976-77	$14,511	$14,539	.0020
1978-79	$16,117	$16,140	.0014
1980-81	$19,168*	$19,250*	.0043
1982-83	$23,251	$23,266	.0006
1984-85	$26,058	$26,082	.0009
1986-87	$29,065	$28,911	-.0053
1988-89	$31,421	$31,204	-.0069

* These figures include administrators in addition to teaching staff.

[135] With two exceptions, these salary figures are based on the teacher data records meeting the case-selection criteria specified in Chapter 1; thus, the statewide averages presented here correspond to the figures presented in Table 3.1 in Chapter 3. The exceptions are for the data years 1974-75 and 1980-81; for these two years it was not possible to exclude administrators since the step and lane information was missing from the data files. In Chapter 3, it was necessary to estimate the statewide average teacher salary figures for these two years, since the purpose of that chapter is to directly compare such figures (excluding administrators) across the years of the study. However, in this Appendix it is necessary to calculate the proportions of teachers in each of the three urbanization categories; this requires the use of individual-level data, which for these two years unavoidably includes administrators (provided they meet the other case-selection criteria). The effect of including administrators in the salary calculations for these two years is to overstate the salary figures by approximately 4.5%. However, assuming that the proportion of staff who are administrators is fairly similar for the three urbanization categories, there should be no distorting effect on the estimate of the urbanization factor itself.